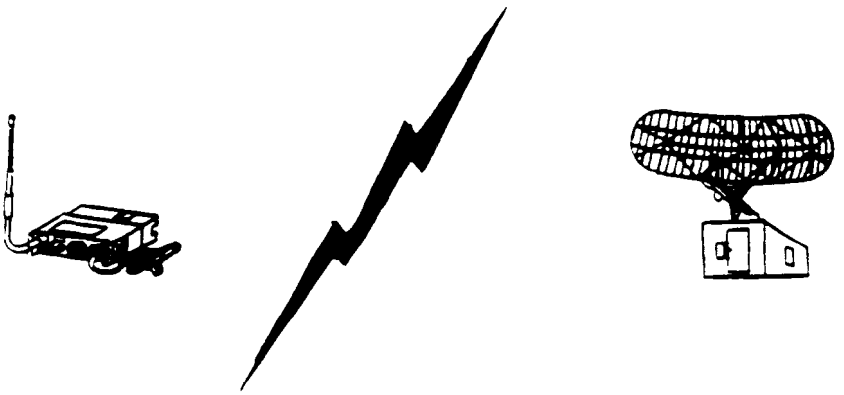
DCN 39

DEFENSE DEPOT MAINTENANCE COUNCIL STUDIES

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

GROUND COMMUNICATIONS AND ELECTRONICS DEPOT MAINTENANCE STUDY



PREPARED FOR:

DEFENSE DEPOT MAINTENANCE COUNCIL

16 JANUARY 1991

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

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(p) Rotary Wing Study Report dated 1 October 1990

(q) Joint Depot Maintenance Analysis Group, Gentile Air Force Station letter of 18 October 1990; Subj: Joint Depot Business Plan

(r) Draft Cost Comparability Handbook, dated 4 December 1990

(s) DDMC Performance Study, draft report, dated November 1990

(t) DDMC Capacity Study, final report, undated

(u) Chairman GCE Study Group ltr to Chairman Cost Comparability Study Group, Code 880 of 11 December 1990 w/1st Endorsement from JPCG-DM Service Executive Group

(v) Chairman Cost Comparability Working Group letter MAW dated 2 Jan 91 to JPCG-DM Service Executive Group

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EXECUTIVE SUMMARY

DEPARTMENT OF DEFENSE GROUND COMMUNICATIONS AND ELECTRONICS STUDY

1. INTRODUCTION:

a. Reference (a), a memorandum from Mr. Robert T. Mason, Executive Secretary, Defense Depot Maintenance Council, Office of the Assistant Secretary of Defense, Production and Logistics, for Defense Depot Maintenance Council members, dated 8 August 1990, established the Ground Communications and Electronics Study and assigned the chairmanship to the United States Marine Corps.

b. Reference (b), a message from the Commandant of the Marine Corps appointed Colonel Terry L. Hodges, USMC, as the Ground Communications and Electronics (GCE) Study Group Chairman.

2. MEETINGS: In accordance with references (a) and (b), a multi-service, Ground Communications and Electronics Study Team was formed and met seven times at various locations to deliberate the depot maintenance requirements of DoD GCE.

3. TEAM COMPOSITION/SITE VISITS: The GCE team composition included representatives from the Army, Navy, Air Force, and Marine Corps. Site visits of GCE depots included Marine Corps Logistics Base, Albany, GA; Tobyhanna Army Depot, Tobyhanna, PA; Sacramento Army Depot and Sacramento Air Logistics Center, Sacramento, CA.

4. OPTIONS ANALYZED:

The GCE team initially identified ten options to evaluate including the movement of Army, Navy, Air Force, and Marine Corps GCE workload on each coast, coast to coast and to Centers of Technical Excellence. The GCE team settled on five options which appeared to offer the highest economic return, were reasonably achievable, and dealt best with the capacity utilization problems evident at some depots. The options analyzed were:

OPTION 1. Move Sacramento Army Depot (SAAD) GCE workload (FY-93 = 813,352 hours) to Tobyhanna Army Depot (TOAD) and the GCE Electro-Optics workload (FY-93 = 100,648 hours) to Anniston Army Depot (ANAD). Appendix (1) illustrates the impact of workload transferred from SAAD to TOAD and ANAD. Appendix (2) provides a detailed assessment of this option from the Army's perspective.

OPTION 2. Move Sacramento Army Depot (SAAD) GCE workload (FY-93 including electro-optics = 914,000 hours) to Sacramento Air Logistics Center (SM-ALC). Appendix (3) illustrates the capacity utilization impact of moving SAAD workload to SM-ALC. Appendix (4) provides a detailed assessment of this option from the Air Force's perspective.

immediate improvement in inter-servicing or competition in private sector workload changes. The sheer magnitude of the data plus the acknowledged inconsistencies and errors prevented any worthwhile progress. Option 5, however, does provide the basis for significant savings by all services through systematic competition of the GCE workload.

8. RECOMMENDATIONS:

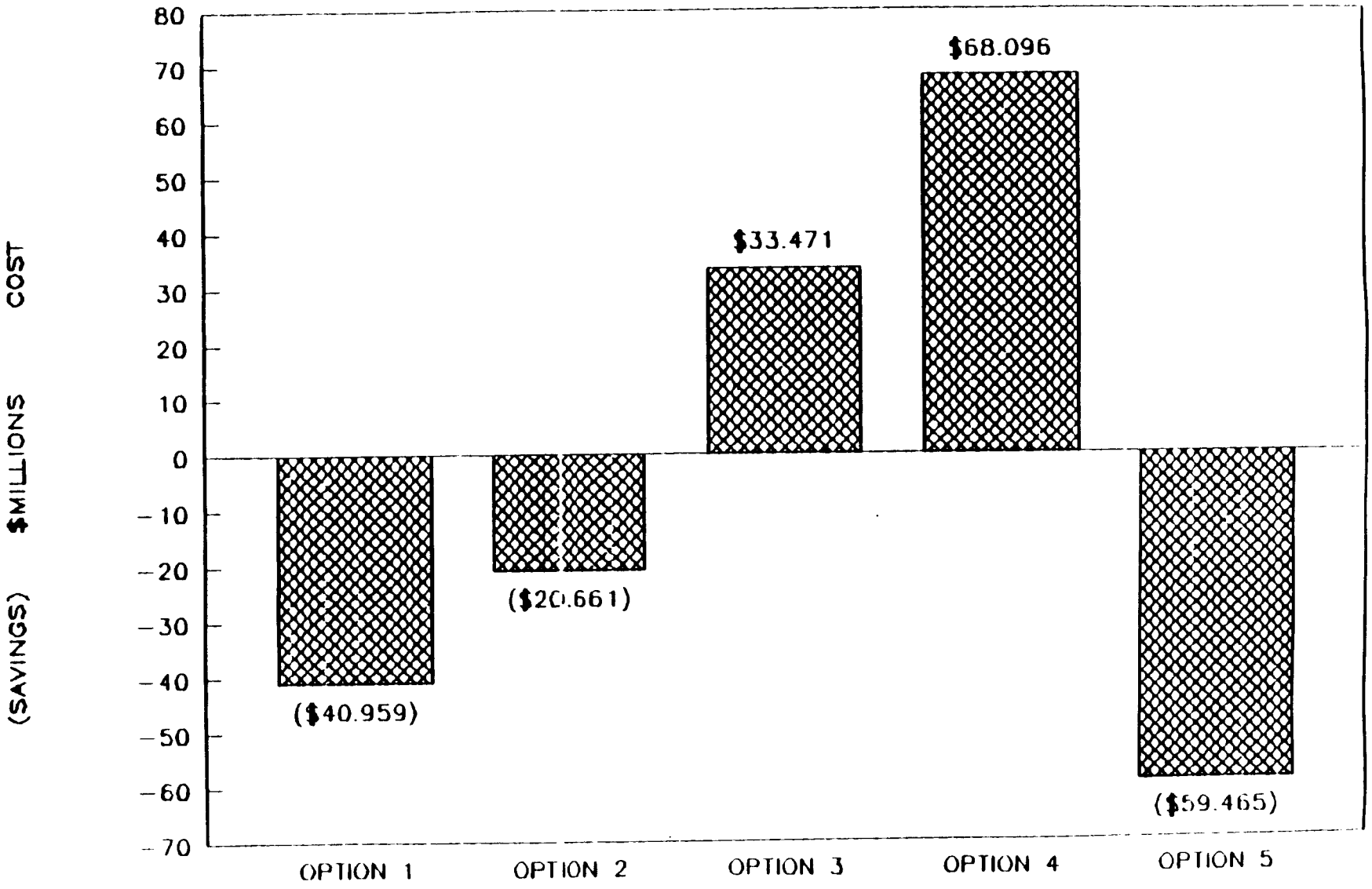
A. CAPACITY UTILIZATION: Evaluation of the data developed indicates that Option 1, the transfer of the GCE workload from SAAD to TOAD and ANAD is the most reasonable and prudent business decision for the DoD to make and will result in a $40.959 million reduction in the cost of operations for depot level maintenance of Army GCE requirements during the five year period covered by the study. Implementation of Option 1 will result in a change in capacity utilization at TOAD from 46% to 64%. After FY-95, an additional $20.807 million savings per year is estimated. TOAD is considered fully capable to assume the additional workload, with only minor facility and equipment adjustments necessary, and should provide the full level of GCE support required at a substantial cost savings. The relocation of the GCE portion of the Electro-Optics workload from SAAD to ANAD may require coordination with the movement of the remaining Missile Electro-Optics workload at SAAD. Chart 1 illustrates the expected cost/(saving) through the period ending FY-95. Chart 2 illustrates the long term savings over time for all of the options. It should be noted that Option 3 offers significant long term savings but because of the initial cost to relocate the workloads to TOAD, the payback is not achieved until the eighth year after implementation.

B. CAPACITY LAYAWAY: Capacity utilization improvements also examined included potential layaway of excess capacity in several depots. Implementation of Option 1 (SAAD to TOAD) will result in a change in capacity utilization from 46% to 64% at TOAD. SM-ALC utilization will remain at 67% to 71% of capacity throughout the period of the study. Layaway at both TOAD and SM-ALC is possible but will require rearrangement of facilities at some cost. Layaway at both depots, however, will save money and should be accomplished as soon as possible. Recommend that layaway of excess capacity be directed by each service to achieve at least 90% capacity utilization within the next two years. It is further recommended that a cost savings report be required to keep track of the savings generated by this activity.

C. INTER-SERVICING AND COMPETITION: Evaluation of the potential for improvement in inter-service workload transfers and public/private competition indicates significant opportunities exist through application of the principals established in Option 5. It is recommended that the plan contained in Option 5, which distributes the savings identified in reference (m), the Joint Service Memorandum for the Assistant Secretary of Defense, be approved for implementation. The plan will save over $59 million

GCE STUDY OPTION ANALYSIS

CUMULATIVE FY-92 TO FY-95



DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES
Ground Communications and Electronics Study

1. INTRODUCTION:

a. Reference (a), a memorandum from Mr. Robert T. Mason, Executive Secretary, Defense Depot Maintenance Council, Office of the Assistant Secretary of Defense, Production and Logistics, for Defense Depot Maintenance Council members, established the Ground Communications and Electronics Study and assigned the chairmanship to the United States Marine Corps.

b. Reference (b), a message from the Commandant of the Marine Corps appointed Colonel Terry L. Hodges, USMC, as the Ground Communications and Electronics (GCE) Study Group chairman.

2. STUDY METHODOLOGY:

A. SCOPE:

(1) This study analyzed the Army, Navy, Air Force, and Marine Corps Ground Communications and Electronics (GCE) depot maintenance workload and depot capacities while recognizing and building upon those previous studies that impact upon depot maintenance of GCE. Ten options were initially identified for analysis including the GCE workload of each service. Selection of the options to analyze in detail took considerable time and debate and eventually settled on the issues that could be dealt with in the time available, offered the highest economic opportunity, related to depots that had been previously identified for potential closure/consolidation and could provide meaningful improvement in capacity utilization at underutilized depots. Options 1 through 5 were selected as the best choices to explore in-depth. Options 1 through 4 analyze relocation of GCE workload from one or more service depot(s) to another while Option 5 lays the foundation for the continued strengthening of GCE depot maintenance through public/public and public/private competition.

(2) The study group considered references (a) through (v) along with other relevant information concerning Ground Communications and Electronics in the development of the options selected.

B. FACTS: The following facts were identified which had a direct bearing on the conduct and outcome of the GCE study.

(1) The transfer of GCE workload from Sacramento Army Depot (SAAD) to various locations became a study option even though savings to be realized through such movement may have been accounted for in the DMRD 908 $1.7 billion savings plan. Relocation of workload/closure of SAAD has been studied many times and is well documented in the references.

related activities in compliance with state and federal regulatory requirements. Several of the depots have a program for the cleanup of hazardous waste sites with cleanup costs running into the millions. No specific cost consideration was given in this analysis to environmental considerations or long term cleanup costs.

(8) Relocation of GCE workload evaluated in each option would be implemented at the beginning of FY-93. The cost/(savings) were calculated assuming benefit for the entire first year through FY-95.

D. CORE LOGISTICS: Core logistics was viewed by each service as an important factor in the performance of their logistics maintenance responsibilities and was considered in the initial analysis of the impact of transferring GCE workloads. The unanimous position of the GCE study group was that the best economic choice would be the recommended option irrespective of core logistics considerations.

E. STUDY GROUP MEMBERSHIP:

ARMY

Mr. Gerald Mercurio, Army Primary Representative, CECOM, Ft.Monmouth, NJ
FAX: 201-544-1378 AVN: 992-1314 COMM: 201-532-1314

Mr. Herbert Gee, Jr., CECOM, Ft. Monmouth, NJ
FAX: 201-544-1378 AVN: 992-3749, COMM: 201-532-3749

Mr. Alan Kupper, CECOM, Ft. Monmouth, NJ
FAX: 992-4953, AVN: 992-4161, COMM: 201-532-4161

Ms. Sally Kann, Depot Systems Command, Chambersburg, Pa.
FAX: 570-9845, AVN: 570-8097, COMM: 717-267-8097

Mr. Frank W. Zardecki, Tobyhanny Army Depot, Tobyhanna, Pa.
FAX: 795-7842, AVN: 795-7211, COMM: 707-894-7211

Mr. Tony Zelinski, Tobyhanna Army Depot, Tobyhanna, Pa.
FAX: 795-7842, AVN: 795-7422, COMM: 717-894-7422

Mr. Brad Jones, Tobyhanna Army Depot, Tobyhanna, Pa.
FAX: 795-7842, AVN: 795-7653, COMM: 717-894-7653

Mr. Jacob P. Kodnovich, Tobyhanna Army Depot, Tobyhanna, Pa.
FAX: 795-7842, AVN: 795-7112, COMM: 717-894-7112

Mr. John Kortright, Tobyhanna Army Depot, Tobyhanna, Pa.
FAX: 795-7842, AVN: 795-7400, COMM: 717-894-7400

Mr. Jess Leidig, Depot Systems Command, Chambersburg, Pa.
FAX: 570-9845, AVN: 570-9985, COMM: 717-267-9985

F. SITE VISITS AND MEETINGS: The study group visited four service GCE facilities: Marine Corps Logistics Base, Albany, GA; Tobyhanna Army Depot, Tobyhanna, PA; Sacramento Army Depot and Sacramento Air Logistics Center, Sacramento, CA. The regular meetings of the GCE team were held at the following locations on the dates noted.

8-10 August 1990, at the Marine Corps Depot Maintenance Activity (DMA), Albany, Georgia

28-29 August 1990; at the Tobyhanna Army Depot (TOAD), Tobyhanna, Pennsylvania

23-25 October 1990; at the Marine Corps DMA, Albany, Georgia

13-16 November 1990; at the Marine Corps DMA, Albany, Georgia

26-30 November 1990; at the Air Force Sacramento Air Logistics Center (SM-ALC), Sacramento California, and the Sacramento Army Depot (SAAD), Sacramento, California.

10-14 December 1990; at the Marine Corps DMA, Albany, Georgia.

7-10 January 1990; at the Air Force Sacramento Air Logistics Center (SM-ALC), Sacramento, California, special visit for hot mockup and ICS/Production Shutdown cost evaluation only.

16-17 January 1991; at the Marine Corps DMA, Albany Georgia.

G. DATA COLLECTED:

(1) The study team obtained and reviewed the material contained in references (a) through (v). Several data calls were made concerning GCE workload, capacity, cost, facilities, rates and related matters.

(2) The Cost Comparability Study Group chairman met with the GCE Study Group on 12 December 1990, and agreed to establish a labor rate consistent with the recommendations contained in the draft Cost Comparability Handbook, reference (r), to level the playing field. The rates recommended by the Cost Comparability Study Group in reference (v) were established after a visit to TOAD and SM-ALC. These composite rates were used to determine the production costs in the analysis of the options considered. Appendix (11) provides a summary of the data used to develop the production costs noted in Table 7.

(3) The service assessment of each option was prepared by the lead service identified for each option and is included, as written by that service, in the appendices. The GCE Study Group analysis, findings and recommendations are provided in the following paragraphs.

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

ORGANIC BASELINE GCE WORKLOAD

TABLE 1

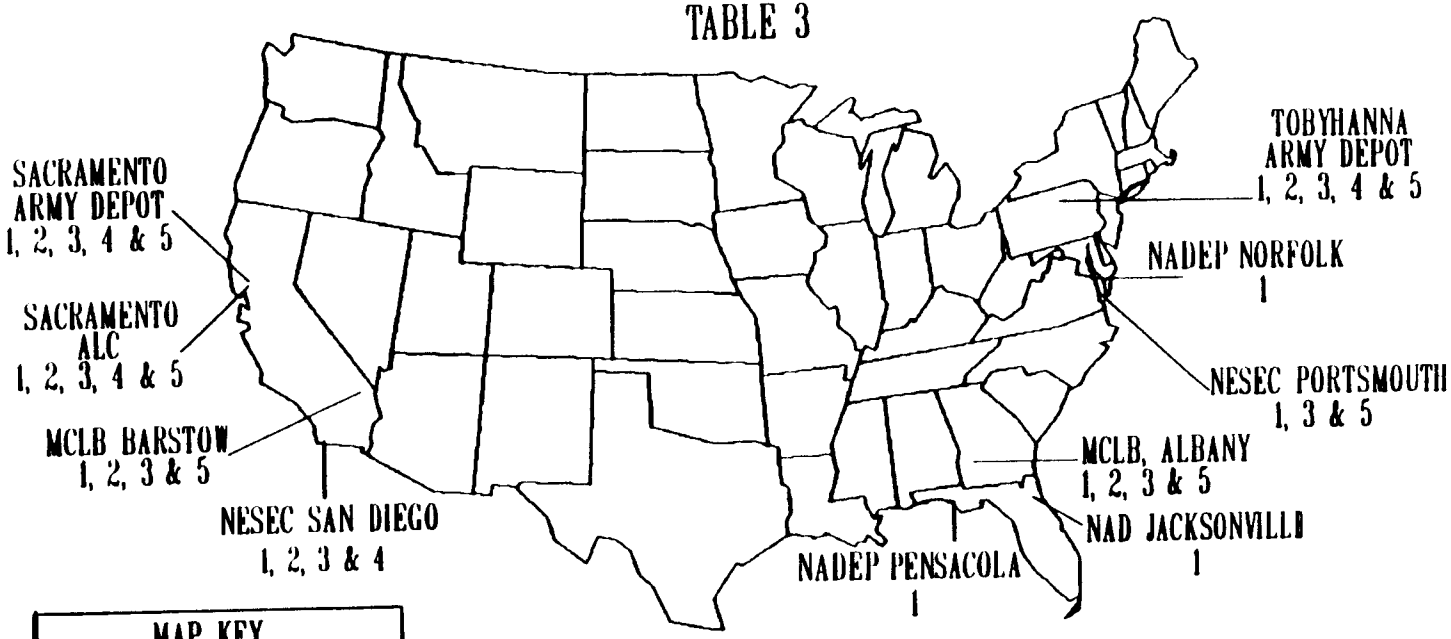
(HOURS IN THOUSANDS)

DEPOT	FY 91 FUNDED WKLD	FY 91 @1615 CAP	FY 91 CAPACITY % UTIL	FY 92 FUNDED WKLD	FY 92 @1615 CAP	FY 92 CAPACITY % UTIL	FY 93 FUNDED WKLD	FY 93 @1615 CAP	FY 93 CAPACITY % UTIL	FY 94 FUNDED WKLD	FY 94 @1615 CAP	FY 94 CAPACITY % UTIL	FY 95 FUNDED WKLD	FY 95 @1615 CAP	FY 95 CAPACITY % UTIL
SAAD	975	2,394	40.73%	1,113	2,394	46.49%	914	2,394	38.18%	914	2,394	38.18%	914	2,394	38.18%
TOAD	1,907	3,859	49.42%	2,122	3,859	54.99%	2,144	4,570	46.91%	2,144	4,570	46.91%	2,144	4,570	46.91%
SM-ALC	1,194	1,777	67.21%	1,265	1,777	71.21%	1,306	1,777	73.52%	1,282	1,777	72.16%	1,272	1,777	71.60%
USMC BAR	206	203	101.67%	170	164	103.38%	169	166	101.57%	170	166	102.17%	181	172	105.07%
USMC ALB	220	213	103.10%	247	238	103.85%	250	238	105.11%	251	240	104.67%	253	240	105.50%
NAD-PN	9	14	64.45%	9	14	65.68%	9	14	65.68%	9	23	38.31%	9	14	65.68%
NAD-JA	1	5	20.43%	1	5	20.43%	1	5	20.43%	1	5	20.43%	1	5	20.43%
NAD-NOR	4	19	20.23%	4	19	21.51%	4	19	21.51%	4	19	21.51%	4	19	21.51%
NESEC SD	16	25	62.87%	18	25	70.73%	19	25	74.66%	21	25	82.52%	23	25	90.38%
NESEC POR	2	4	51.08%	2	4	51.08%	2	4	51.08%	2	4	51.08%	2	4	51.08%
TOTALS	4,534	8,512	53.26%	4,951	8,498	58.26%	4,818	9,211	52.31%	4,798	9,223	52.02%	4,803	9,219	52.10%

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

ORGANIC/INTERSERVICE DEPOT LOCATIONS

TABLE 3



MAP KEY
1 - RADIO
2 - RADAR
3 - WIRE COMMUNICATIONS
4 - COMSEC/CRYPTO
5 - OTHER

During the GCE Study several weapon systems were identified whose description and purpose were not the same in the Air Force and the Army. As an example the Air Force categorization of Space Systems was not the same as the Army's in every case. On the surface, the categories described above appear clear and understandable. In practice, however, some equipment types may not have been classified the same in every case. The group felt it necessary to address this issue, but also agreed it would not in any way alter the outcome of the study.

C. INTER-SERVICE WORKLOAD: Current GCE Depot Maintenance Inter-service Support Agreements (DMISAs) data was collected and analyzed. Table 5 reflects GCE inter-servicing activity between the services. The quantity of NSN'S is provided to illustrate the extent to which GCE inter-servicing is currently accomplished. The GCE agent/maintenance manager and source of repair are identified in summary form.

The inter-serviced workload average values for fiscal years 91 through 95 for the GCE workload are summarized below to illustrate several opportunities available.

SERVICE	% INTER-SERVICED	$'S INTER-SERVICED
Army	4.39%	$52,000,000
Navy	57.60%	$5,583,000
Air Force	3.53%	$18,427,000
Marine Corps	10.00%	$12,101,000

D. ORGANIC WORKLOAD: Table 4 provides a view of the basic GCE categories of organic workload accomplished in the service depot maintenance activities.

E. FUNDING DISTRIBUTION: Table 2 illustrates each service's depot maintenance GCE funding distribution by sources of maintenance. Table 2 also provides an overview of the total DoD cost of each category of workload for the period FY-91 through FY-95 and the percent of total dollars expended.

F. WORKLOAD ANALYSIS: The first step in analyzing communication and electronics depot level maintenance was to evaluate baseline organic workload present and planned. Table 1 contains the Army, Navy, Air Force, and Marine Corps funded and projected to be funded organic GCE workload for fiscal years 91 through 95. Inter-service and contracted out requirements are identified in Table 2. Analysis of the data in both tables indicates that a capacity utilization problem exists in several depots and that opportunities do exist to contract out or inter-service non-core portions of the organic GCE workload.

G. MAINTENANCE AND SUPPORT FACILITIES:

(1) An assessment of Ground Communications and Electronics Depot Facilities was conducted following site visits. The study chairman and most team members participated in site surveys.

(2) The Army's ground communications and electronics maintenance depots are located in Sacramento, California and Tobyhanna, Pennsylvania. Although the Army currently maintains a west coast and an east coast facility, the maintenance workload is not assigned based on geographical location or redundant sources of repair. Assignments are made by commodity groupings and technologies. TOAD accomplishes 66% of the Army's GCE workload and SAAD accomplishes the remaining 34%. As an example, TOAD is responsible for Army Satellite Communications equipment whereas, SAAD is the prime depot for Electro-Optical equipment. Both depots provide quality communications and electronics maintenance support for the Army, inter-service, and foreign military sales customers. TOAD and SAAD have a large skill base of various electronic disciplines needed to support the technologies maintained at each depot.

(3) The Navy's ground communications and electronics maintenance depots are located in San Diego, California, Portsmouth Virginia, NADEP'S Norfolk, Virginia., Jacksonville, and Pensacola, Florida. The depots mission and functions are supported by facilities that are equipped to repair and rebuild the full range of Navy end item and component repair requirements, including printed circuit cards, modules and assemblies from electronic warfare systems, teletype, radiac, crypto, and communications and electronic systems. The depots are also involved in the fabrication and manufacturing of electronic assemblies and provide professional engineering management and program execution support to various Navy systems.

(4) The Air Force's Sacramento ALC is the sole Air Force depot for GCE. SM-ALC was developed with the flexibility to meet both GCE requirements and aircraft electronics requirements for printed circuit boards, automatic test equipment, software and other support requirements. This large modern depot has extensive ground radar support equipment and facilities complete with total system mock-ups to support maintenance and ICP management functions. Specialized capabilities include a printed circuit emulation facility, a fiber optics laboratory, a neutron radiography facility, extensive modern environmentally controlled resources, and a live target radar range.

GROUND COMMUNICATIO. , ELECTRONICS STUDY

GCE DEPOT BASELINE SKILL DISTRIBUTION

TABLE 6

SKILLS FY-91 92	ARMY SAAD	ARMY TOAD	AIR FORCE SM-ALC	USMC ALBANY	USMC BARSTOW	NAVY NAD-PN	NAVY NAD-JA	NAVY NAD-NOR	NAVY NESEC-SD	NAVY NESEC-POR	TOTAL DOD
RADIO MECHANICS/INSPECTORS	154	429	74	22	22	7	6	4	9	22	749
RADAR MECHANICS/INSPECTORS	101	105	473	21	20						720
WIRE COMMUNICATIONS MECHANICS/INSPECTORS	106	115	46	20	15					9	311
COMMSEC/CRYPTO MECHANICS/INSPECTORS	171	151	9	0	0				9		340
OTHER MECHANICS/INSPECTORS	112	168	117	53	52						502
DOD TOTAL GCE SKILLS	644	968	719	116	109	7	6	4	18	31	2622
DEPOT % OF TOTAL DOD	24.6%	36.9%	27.4%	4.4%	4.2%	0.3%	0.2%	0.2%	0.7%	1.2%	100.0%

(3) Workload analyzed also included sole-source private sector contracts for potential savings through relocation to organic depots, organic depot workload to be competed, and the economies to be realized through movement of workload from one DoD depot to another to improve capacity utilization and inter-servicing objectives. Data available did not support meaningful analysis or results in the area of immediate improvement in inter-servicing or competition in private sector workload changes. The sheer magnitude of the data plus the acknowledged inconsistencies and errors prevented any worthwhile progress. Option 5, however, does provide the basis for significant savings by all services through systematic competition of the GCE workload.

L. OPTION ANALYSIS:

(1) Analysis and verification of individual cost factors were accomplished to identify the option(s) that would yield the best savings. FY-93 was selected as the beginning year for options 1 through 4 to allow sufficient time to implement the options recommended. FY-92 was selected as the beginning year for option 5 to support the savings targets identified in reference (m).

(2) Production cost analysis was identified as the most significant element and was initially to be determined by workload hours times the published industrial fund rate for the activity. It was determined that over $21 per hour rate difference existed between TOAD vs. SM-ALC and SAAD if the current actual billing rates were used.

(3) The Air Force took strong exception to this approach preferring to use "unit sales prices", a position well documented in the references. A compromise was eventually agreed to, wherein, the Cost Comparability Study Group would establish a "verified rate" to be used in lieu of the established industrial fund rate structure currently in effect. The GCE study team unanimously agreed to this approach. The verified rate, while not perfect, includes all of the activity operating costs, and is a valid measure of the overall efficiency of operations at a given activity.

(4) Several factors in the evaluation required more in-depth analysis. The Air Force, in Option 3, Appendix (6), initially identified a $53.8 million cost to replicate the "hot mock-ups" used at SM-ALC that are not available for movement to TOAD, but would be required to support production of Air Force GCE workload. On-site evaluation of this equipment by a special GCE evaluation team (Marine Corps and Army) to validate the requirements and identify alternative methods of testing verified that $46.130 million of the hot mock-up requirements identified were valid requirements for Inventory Control Point (ICP) use and production test and inspection of end items and components rebuilt or repaired. Also, the team verified that alternate test methods were not practical for the equipment tested on the mock-

operations for depot level maintenance of Army GCE requirements. TOAD is considered fully capable to assume the additional workload, with only minor facility and equipment adjustments necessary, and should provide the full level of GCE support required. The 100,648 hours of Electro-Optic workload to be transferred to ANAD can be accomplished after development of special Electro-Optic facilities required. Movement of the Electro-Optic workload will require coordination with the Missile Electro-Optic workload, which is approximately three times larger than the GCE Electro-Optic workload.

COST SAVINGS: Selection of option 1 offers a cost savings to the government of $40.959 million over the period FY-93 to FY-95.

INTER-SERVICING AND COMPETITION: Evaluation of the potential for improvement in inter-service workload transfers and public/private competition indicates that significant opportunities exist through application of the principals established in Option 5. It is recommended that the plan contained in Option 5, which distributes the savings identified in reference (m), the Joint Service Memorandum for the Assistant Secretary of Defense, be approved for implementation. The plan will save over $59 million dollars on GCE workload scheduled during the period FY-92 to FY-95 if fully implemented. Action to implement this option should begin in FY-91 and will require the development of a detailed business plan by each service. Development of the necessary technical data to support full and meaningful competition will require a large scale effort and should begin immediately. There was unanimous agreement by the study group membership that candidates, by specific item identification, for competition and interservicing could not be provided at this time, but would be developed by the service business offices when core statements are completed and procedures are in place. Schedules, priorities, and plans should be built around data supportable competitions. Tables 1 through 4 of Appendix (10) provide a breakout by year. Table 5 of appendix (10) provides a summary of the total savings for Option 5.

COST SAVINGS: Selection of option 5 offers a cost savings to the government of $59.466 million over the period FY-92 to FY-95.

CAPACITY TRANSFER AND DIVESTITURE:

(1) The excess capacity at SAAD, available after transfer of the GCE and Electro-Optics workload, can be converted to other purposes or sold to the private sector. The estimated annual savings to be realized from the vacated facilities can not be estimated within the bounds of the GCE Study. No cost savings have been included in this analysis for the vacated space at SAAD. Obviously, many options exist concerning its future use including layaway, conversion to storage facilities, or eventual sale to the private sector.

GROUND COMMUNICATIONS ELECTR STUDY

OPTION COST/(SAVINGS) ANALYSIS

($000,000) TABLE 7

COST/(SAVINGS) ELEMENTS	<---SAAD TO TOAD--->		<--SAAD TO SM-ALC-->		<---------- SAAD AND SM-ALC TO TOAD & ANAD ---------->						SM-ALC TO OTHER ALC'S	
	OPTION 1 ARMY	OPTION 1 ALLOW	OPTION 2 AIR FORCE	OPTION 2 ALLOW	OPTION 3 AIR FORCE	OPTION 3 AF ALLOW	OPTION 3 ARMY	OPTION 3 A ALLOW	OPTION 3 SUM A+AF	OPTION 3 SUM ALLOW	OPTION 4 AIR FORCE	OPTION 4 ALLOW
RELOCATION OF PROD EQUIP	$3.888	$3.888	$3.032	$3.032	$3.600	$3.600	$3.888	$3.888	$7.488	$7.488	$4.000	$4.000
PERSONNEL REDISTRIBUTION	$15.735	$15.735	$2.560	$2.560	$14.600	$14.600	$15.735	$15.735	$30.335	$30.335	$19.700	$19.700
CAPACITY DEV (W/O ICS)	$4.530	$2.664	($2.568)	$1.930	$8.700	$8.700	$4.530	$2.664	$13.230	$11.364	$8.700	$8.700
		NOTE 11^		NOTE 7^				NOTE 11^				
"NOT MOCKUP"	$0.000	$0.000	$0.000	$0.000	$46.130	$46.130	$0.000	$0.000	$46.130	$46.130	$0.000	$0.000
TRANSPORTATION CHANGE	($9.126)	($9.126)	$0.000	$0.00	$1.000	$1.000	($9.126)	($9.126)	($8.126)	($8.126)	$0.000	$0.000
INVENTORY ADJUSTMENTS	$0.577	$0.577	$0.081	$0.081	$1.700	$1.700	$0.577	$0.577	$2.277	$2.277	$1.700	$1.700
NEW PERSONNEL	$1.000	$1.000	$0.027	$0.250	$10.400	$10.400	$1.000	$1.000	$11.400	$11.400	$10.500	$10.500
				NOTE 8^9v		NOTE 12v						NOTE 11v
PROD SHUTDOWN	$1.500	$1.500	$0.000	$1.500	$30.200	$30.200	$1.500	$1.500	$36.700	$35.200	$30.200	$30.200
PRODUCTION COST CHANGES SEE NOTE 1	($107.04)	($51.193)	($18.489)	($23.910)	($7.800)	($42.902)	($107.040)	($51.194)	($114.840)	($94.016)	($4.500)	($4.500)
		NOTE 5^	NOTE 2^	NOTE 5^		NOTE 5^		NOTE 5^				
		NOTE 6v		NOTE 6v		NOTE 6v		NOTE 6v				NOTE 6v
16% IND	$0.000	($2.104)	$0.000	($2.104)	$0.000	($2.577)	$0.000	($2.104)	$0.000	($4.681)	($4.900)	($2.204)
MILCON	($3.900)	($3.900)	($3.900)	($3.900)	$0.000	$0.000	($3.900)	($3.900)	($3.900)	($3.900)	$0.000	$0.000
BASE OPERATIONS SUPPORT	($13.200)	$0.000	($13.20)	$0.000	$0.000	$0.000	($13.200)	$0.000	($13.200)	$0.000	$0.000	$0.000
		NOTE 3^		NOTE 4^				NOTE 3^				
NET COST/ (SAVINGS)	($106.036)	($40.959)	($32.457)	($20.561)	$108.530	$70.851	($106.036)	($40.960)	$7.494	$33.471	$65.400	$68.096

NOTE 00^ = NOTE REFERS TO ITEM ABOVE. NOTE 00v = NOTE REFERS TO ITEM BELOW

WEAPONS SYSTEM MATRIX: Table 8 provides the data desired in the Weapons System Matrix format to the extent gross data can be compressed into a single table.

OPTION 1 WEAPON SYSTEM MATRIX

FIELD	EXPLANATION
A	INCLUDES ALL GCE WORK AT SAAD
B	ARMY IS PRIMARY USER/LEAD SERVICE
C	UNDETERMINED, SERVICE CORE POSITIONS IN STATE OF FLUX
D	NOT AVAILABLE IN GCE STUDY DATA
E	SAAD(AD) IS CURRENT SOR TOAD(TB) IS NEW SOR FOR GCE OTHER THAN E/O ANAD(AI) IS NEW SOR FOR E/O
F	914,000 M/H IS SAAD W/L FOR FY-93-95 813,352 M/H TRANSFERS TO TOAD 100,648 M/H TRANSFERS TO ANAD
G	914,000 M/H X $54.27(SAAD RATE W/W MAT) = $49.603M 813,000 M/H X $34.60(TOAD RATE W/O MAT.)= $28.142M 100,648 M/H X $43.68(ANAD RATE W/O MAT.)= $4.396M
H	CONSOLIDATION DECISION IMPLEMENTED IN FY-93
I	SERVICE INCURRING COSTS AND SAVINGS IS ARMY(A) COST OF ACTION INCLUDES ALL COST OF IMPLEMENTING ACTION IN FY. GROSS SAVINGS INCLUDES ALL SAVINGS RESULTING FROM ACTION IN FY. NET SAVINGS = SAVINGS MINUS COSTS ON AN FY BASIS
J	SOR TO EXPERIENCE WORKLOAD OR CAPACITY CHANGE
K	WORKLOAD CHANGE (ENTREES ARE NOT ADDITIVE FROM FY TO FY)
L	CAPACITY CHANGE (ENTREES ARE NOT ADDITIVE FROM FY TO FY)

WEAPON SYSTEM MATRIX
SOR ACTION

OPTION 5 - AIR FORCE

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	PROJECTED SAVINGS ($M)						
A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (SUM-H)	G ANNUAL DOLLAR SS BASE ($M)	H CORE, NS OR PPC INCREASE (CORE - FY) (NS - FY) (PPC - FY)	SERVICE	91	92	93	94	95	TOTAL
								COST OF ACTION:						
								F(L/S)		.0367	.0933	.111	.1077	.469
								F(P/PC)	--	.4	.600	.999	1.598	3.597
GROUND COMM. AND ELECTRONICS EQUIP.	F(L)	AC/NC	N/A	N/A	N/A	15.622	L/S (NOTE 1)							
	F(L)	AC/NC	N/A	N/A	N/A	89.913	P/PC (NOTE 1)							
						105.535								
PRIOR TOTAL								GROSS SAVINGS:						
								F(L/S)	--	.1867	.4733	.563	.7507	1.875
								F(P/PC)	--	2.0	2.998	4.994	7.991	17.983
NEW TOTAL								NET SAVINGS:						
								F(L/S)	--	.140	.280	.423	.563	1.406
								F(P/PC)	--	1.6	2.398	3.995	6.393	14.386

NOTE 1 : FY92-95 CUMULATIVE

WORKLOAD AND CAPACITY DATA										
J SOR	K WORKLOAD CHANGE					L CAPACITY CHANGE				
	91	92	93	94	95	91	92	93	94	95
N/A	--		--	--	--	--				

WEAPON SYST MATRIX
SOR ACTION

OPTION 5 - MARINE CORPS

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION
A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (BLM-H)	G ANNUAL BUSINESS BASE ($M)	H CORE, NO OR PAPC DECISION (CORE - FY) (NO - FY) (PAPC - FY)
Ground Comm and Electronics Equip	M(L) M(L)	AC/NC AC/NC	NA NA	NA NA	NA NA	5.689 21.400	I/S (Note 1) P/PC(Note 1)
PRIOR TOTAL						27.089	
NEW TOTAL							

PROJECTED SAVINGS ($M)						
SERVICE	91	92	93	94	95	TOTAL
COST OF ACTION:						
M(I/S)	-	.0213	.032	.0533	.064	.171
M(P/PC)	--	-	.136	.288	.432	.856
GROSS SAVINGS:						
M(I/S)	--	.085	.128	.2133	.256	.682
M(P/PC)	--	--	.680	1.440	2.160	4.28
NET SAVINGS:						
M(I/S)	--	.064	.096	.160	.192	.512
M(P/PC)	--	--	.544	1.152	1.728	3.424

NOTE 1: FY-92-95 Cumulative

WORKLOAD AND CAPACITY DATA										
J SOR	K WORKLOAD CHANGE					L CAPACITY CHANGE				
	91	92	93	94	95	91	92	93	94	95
NA	--	--	--	--	--	--	--	--		--

GROUND COMMUNICATIONS A[illegible] [illegible] STUDY

OPTION 1 MOVE SAAD GCE WORKLOAD TO TOAD

(SAAD ELECTRO-OPTICS TO ANAD)

APPENDIX (1)

(HOURS IN THOUSANDS)

DEPOT	FY 91 FUNDED WKLD	FY 91 @1615 CAP	FY 91 CAPACITY % UTIL	FY 92 FUNDED WKLD	FY 92 @1615 CAP	FY 92 CAPACITY % UTIL	FY 93 FUNDED WKLD	FY 93 @1615 CAP	FY 93 CAPACITY % UTIL	FY 94 FUNDED WKLD	FY 94 @1615 CAP	FY 94 CAPACITY % UTIL	FY 95 FUNDED WKLD	FY 95 @1615 CAP	FY 95 CAPACITY % UTIL
SAAD	975	2,394	40.73%	1,113	2,394	46.49%									
TOAD	1,907	3,859	49.42%	2,122	3,859	54.99%	2,957	4,570	64.71%	2,957	4,570	64.71%	2,957	4,570	64.71%
SM-ALC	1,194	1,777	67.21%	1,265	1,777	71.21%	1,306	1,777	73.52%	1,282	1,777	72.16%	1,272	1,777	71.60%
USMC BAR	206	203	101.67%	170	164	103.38%	169	166	101.57%	170	166	102.17%	181	172	105.07%
USMC ALB	220	213	103.10%	247	238	103.85%	250	238	105.11%	251	240	104.67%	253	240	105.50%
NAD-PN	9	14	64.45%	9	14	65.68%	9	14	65.68%	9	23	38.31%	9	14	65.68%
NAD-JA	1	5	20.43%	1	5	20.43%	1	5	20.43%	1	5	20.43%	1	5	20.43%
NAD-NOR	4	19	20.23%	4	19	21.51%	4	19	21.51%	4	19	21.51%	4	19	21.51%
NESEC SD	16	25	62.87%	18	25	70.73%	19	25	74.66%	21	25	82.52%	23	25	90.38%
NESEC POR	2	4	51.08%	2	4	51.08%	2	4	51.08%	2	4	51.08%	2	4	51.08%
ANAD							101	101	100.00%	101	101	100.00%	101	101	100.00%
TOTALS	4,534	8,512	53.26%	4,951	8,498	58.26%	4,818	6,918	69.64%	4,798	6,930	69.24%	4,803	6,926	69.35%

GROUND COMMUNICATIONS-ELECTRONICS STUDY

OPTION I - MOVEMENT OF GC&E FROM SAAD TO TOAD

I. ASSUMPTIONS

a. Sacramento Army Depot will close with GC&E workload primarily transferring to Tobyhanna Army Depot.

b. The Sacramento Army Depot electro-optics workload will transfer to Anniston Army Depot.

c. The Army workload was derived from the Budget Strat for FY91-93. FY94 and FY95 workload was straight-lined from FY93. Reimbursable workload was based on historical data.

d. Workload was not decremented based on a declining defense budget.

e. Maximum capacity is defined by 1615 direct labor man-hours per year x the number of work positions x .95 and are calculated based on the maximum number of direct labor personnel that can work a single shift.

II. WORKLOAD CAPACITY/IMPACT

a. Tobyhanna Army Depot's current total capacity of 5.3 million man-hours (which includes 3.9 GC&E capacity) leaves considerable surge capacity/capability even after assuming the SAAD GC&E workload.

b. Tobyhanna Army Depot's total capacity will increase to 6.1 million man-hours with GC&E capacity of 4.6 million man-hours in FY93. This increased capacity is attributable to two congressionally approved military construction projects; e.g. a 178,000 square foot Communications Security (COMSEC) Facility and a 67,000 square foot Satellite Communications Mission Facility.

c. In computing capacity, it is important to recognize that GC&E is a theoretical sub-category of the C-E commodity group. In practice, there is much commonality between the two. The same types of personnel skills, test equipment, and workplace are required to support C-E workload. For these reasons, GC&E capacity and C-E capacity can be considered the same.

III. COST SAVINGS

a. Transfer of SAAD's workload to TOAD results in a DOD savings of $106,036,000 during the period FY93-95. Tobyhanna Army Depot's substantially lower operating cost are reflected in its highly competitive bid rate (lowest in the U.S. Army Depot System Command) which easily overcomes the onetime costs incurred by the SAAD closure.

b. Tobyhanna's competitive bid rate equates to a lower operating cost. Contributing factors include wage grade locality pay differences, organizational structure, direct to indirect ratios, direct labor yield, grade

e. Readiness to the Army will be enhanced because of the consolidation of workloads. This is due to the following:

(1) Availability of a larger electronic skill base capable of supporting all CE commodities.

(2) The commonality of repair parts and test equipment.

(3) Reduced transportation time due from the proximity of users.

f. The SAAD to TOAD option would clearly satisfy the Army's "core" requirements.

g. This option represents the least disruption in service for current SAAD CC&E customers since the equipment would still be serviced within the Army logistics system.

h. Tobyhanna can reacquire 19,800 acres of adjacent land for expansion purposes in the event of any national emergency.

V. POTENTIAL LAYAWAY

Potential layaway of buildings at SAAD for mobilization would result in the retention of 201,828 sq. ft. of work space and a savings of _____. Depot plant equipment which has not been transferred to TOAD could remain onsite and be included in the layaway.

VI. PROS AND CONS

a. Consolidation of all of Army's CC&E workload at TOAD will result in a U.S. Army Center of Technical Excellence for Communications-Electronics. Army's overall level of expertise would be greatly enhanced since all skills associated with C-E would be available at one location, thus facilitating technology sharing and creating a wider base of electronics knowledge. All of the depot's engineering skills would be singularly devoted to C-E, without the dilution of focus inherent in multi-commodity scenarios. This action will eliminate a significant duplication of facilities that presently exist within the Army. Industrial plant utilization rates will increase at all depots that receive transferred maintenance workload, and the utilization rates of Army depot maintenance facilities as an entire system will also increase due to the reduction in the overall capacity base.

b. This option allows the Army in particular and DOD overall to take advantage of the significantly lower operating costs at TOAD rather than SAAD--thus executing the work at a $106,036,000 savings over a 5-year period.

c. Tobyhanna will receive the largest portion of SAAD's workload. Automated maintenance systems such as the Maintenance Shop Floor System and the Automated Storage and Retrieval System which are modern state-of-the-art information and material delivery systems to support this workload are already operational at TOAD.

i. Since 1975, TOAD has been responsible for providing satellite communications systems for the Tri-Services, White House, and NATO Signatories. TOAD provides support for both strategic and tactical satellite systems. By virtue of TOAD's experience and expertise in the field of satellite communications and involvement with the Space Technology Working Group, the depot was selected as CTX for Space Communications. TOAD maintains the engineering test bed for Satellite Digital Communications Subsystems (DCSS) for the Defense Satellite Communications Systems. TOAD has designed and built the majority of DCSS sites worldwide.

j. Maintenance Support Facilities/Capabilities

(1) Tobyhanna Army Depot performs complete repair/overhaul for a variety of GCA, Surveillance, Interrogator, Weather and Mortar Locating Radar Systems. Maintenance services include overhaul modification, and upgrade and performance testing to original manufacturing specifications. Furthermore, technical support is provided by an experienced staff of professional engineers who possess a high degree of expertise in the area of radar technology.

(2) In addition, TOAD operates two Radar Antenna Pattern Ranges. These ranges give TOAD the capability to align and test many types of radar antenna. Using a sophisticated AZ over EL over AZ Test Pedestal, the Radiation Patterns, in the form of Amplitude vs. Azimuth plots, in any axis as required, are calculated and hard copies are produced by chart recorders. Axis include the horizontal, vertical, and the rotor used in the AN/MPQ-4A Mortar Locating Radar System. Horizontal and Circular Polarization mode adjustments are done onsite and the antennas are retested. Once complete these antennas are put in optimum optical, mechanical and electrical calibration before being returned to the radar system for final operational testings.

(3) The radar systems that have antennas tested at these ranges are:

AN/TPN-18/18A Radar
AN/FPN-40 Radar
AN/FSQ-84/84A Radar
AN/TSQ-71B Air Traffic Control Central
AN/TPX-41/44/46 Interrogator
AN/MPQ-4A Mortar Locating Radar

(4) Tobyhanna performs final operational tests on all of the above mentioned Ground Control Approach Radars on our live target range. This includes conducting final precision approach of the overhauled radars with an aircraft to 300 ft. AGL. Accuracy of the radar is verified using a theodolite which has a .02 degree resolution. The surveillance modes and communication capabilities of these systems are checked during the flight test. This unique capability ensures high quality radar systems are fielded to Army aviation units.

o. Fiber Optics

(1) Tobyhanna has established repair/overhaul capability to support Fiber Optic workload. Specialized equipment necessary to manufacture/repair/overhaul fiber optic cable assemblies is in place. Equipment available includes a fusion splicer, optical time domain reflectometer (OTDR), cutting and polishing machines, optical attenuation test sets, and associated tools. Tobyhanna is presently fabricating new and/or upgrading through technology insertion previously built systems which use fiber optics extensively. These fabricated systems include: the Defense Satellite Communications System - Operations Control System (DOCS); the Digital Group Multiplexor for PM Multi-Service Communications System (AN/-173, AN/TRC-174, AN/TRC-175, and AN/TRC-138A); and the Remote Relay System AN/TSQ-144 (Guardrail V); Corps Theatre Automated Service Center II; (CTASCII); Relocatable Army Processors for Intelligence Data Europe (RAPIDE); and Mobile Battle Management Demonstrator.

(2) Tobyhanna designed, manufactured and completed systems integration of 30 AN/TSQ-146 Digital Group Multiplexer (DGM) shelter systems for the Air Force. This effort included fabrication, test, technical manual preparation and provisioning.

p. Satellite Communications - Tobyhanna Army Depot provides the following support services to Project Manager Satellite Communications (PM SATCOM).

(1) Organic Depot Level Maintenance (DLM) - TOAD serves as the prime mission depot providing DLM repair/overhaul support for virtually all SATCOM Strategic, Tactical and Control systems. As the prime mission depot, TOAD supports approximately 25 unique major Satellite Terminals and over 2,100 Line Replaceable Units (LRUs), Subassemblies and modules. Several specific examples include:

(a) Ground Mobile Forces (GMF) Satellite Terminals such as the AN/TSC-85/93, Air Force AN/TSC-94/100, AN/GSC-40 Combined Ground Command Post Terminal and AN/MSC-64 Force Terminal.

(b) Strategic Satellite Terminals to include the AN/FSC-78/79, AN/GSC-39, AN/GSC-49 Jam Resistant Secure Communications (JRSC) Terminal and the Digital Communications Satellite Subsystem (DCSS).

(c) AN/MSQ-114 Satellite Communications Monitoring and Control Central and subsystems of the Defense Satellite Communications System Operational Control System (DOCS).

(d) Future DLM workload includes the AN/GSC-52 State-of-the-Art Medium Terminal (SAMT), Single Channel Objective Tactical (SCOTT), Anti-Jam Control Modem (AJCM) and CM-73 Digital Data Modem.

(2) Design and Development and Manufacturing - TOAD serves as the prime system integrator for the DCSS. Our mission includes engineering design, fabrication, integration and testing of complex state-of-the-art systems deployed worldwide. Examples include the AN/MSC-66 DCSS Van, AN/MSC-74 Operations (OPS) Van and approximately 74 unique electronic racks and interfaces.

r. Tobyhanna also has its own in-house Technical Training School (Toby Tech) with 7 full-time instructors providing instruction in soldering, basic math, specialized test equipment, digital electronics, linear and digital integrated circuits to name a few. Tobyhanna has its own in-house 4-year Apprentice Program in electronics and metal trades. Employees enter the program as trainees and graduate as full-fledged journeymen. This was the first Department of Labor approved Electronics Apprentice Program within DOD.

s. The Center of Technical Excellence (CTX) concept was created within DESCOM to assure complete integration of the depot industrial base in support of the total acquisition life cycle. Under this concept, individual depots are designated as the CTX for selected major new weapon systems and must then provide intensive logistics management of the new system from inception thru fielding. Based on TOAD's capabilities and technical expertise, it is currently assigned 12 CTX programs - the most of any depot within DESCOM.

t. Total Quality Management - Tobyhanna Army Depot has always been recognized for its progressive and innovative management initiatives throughout the Army. In 1988 the depot committed itself to the implementation of TQM. The process began with a rigorous training program for all senior level managers. This included mandatory sessions by the Federal Quality Institute, Deming Seminars, Statistical Process Control Classes, and a host of other training that provided a common language for management. The efforts have set the stage for a number of process improvements. One of the depot's most critical processes, the acquisition cycle, was dissected and analyzed to identify and implement improvements through a Process Action Team. In addition to these formal process improvements, numerous experiments are being conducted within the Supply and Contracting arenas. To further develop our continuous improvement ability a TQM/Customer Relations session is taught monthly to the depot workforce. The TQM efforts and those of the depot's Quality Circles have been integrated to ensure a common direction.

u. In cooperation with East Stroudsburg University, VIASAR (Voice Interface for Automated Storage and Retrieval) has reduced material handling, keypunch errors contributing to increased productivity. VIASAR removes the need for stationery process stations allowing workers to move freely to the workload, induct data and correct errors immediately. Data is inducted via voice input and errors are isolated and reported via voice output eliminating labor intensive tasks by operators.

v. Printed Circuit Board Manufacturing - Tobyhanna Army Depot has the capability to fabricate single and double-sided Printed Circuit Boards (PCBs). Features of this operation include: a central reproduction area with imaging systems, state-of-the-art PCB fabrication equipment, component assembly workstations, and MIL-P-55110 test and inspection stations. Equipment necessary for manufacture of multi-layer printed circuit boards is presently being acquired. The design of PCBs is done with a Computer Vision Computer Aided Engineering System, allowing the efficient production of a Level III Drawing Package and any required Technical Manuals. Testing of the completed PCBs is accomplished with utilization of Automatic Test Equipment (ATE).

GROUND COMMUNICATION-ELECTRONICS STUDY
IMPACT OF MOVING SAAD TO TOAD
DOLLARS IN MILLIONS

TAB	COST ELEMENT	FY91	FY92	FY93	FY94	FY95	COST
1.	RELOCATION OF PRODUCTION EQP						
	TSC			3.835			3.835
	SHIPPING			.053			.053
2.	PERSONNEL REDIST						
	UNEMP COMP			.990			.990
	SEVERANCE			4.948			4.948
	PCS-CIV			9.689			9.689
	PCS-MIL			.108			.108
3.	CAPABILITY/DEV						
	CONSTRUCTION			4.500			4.500
	TRANSITION			1.476			1.476
	CLOSE DOWN			.056			.056
4.	TRANSPORTION CHG			(3.042)	(3.042)	(3.042)	(9.126)
5.	INVENTORY			.577			.577
6.	NEW PERSONNEL						
	PRODUCTIVITY LAG			.831			.831
	RECRUIT EXP			.170			.170
7.	CHG IN PROD COST						
	OVERHEAD/DIFF			(10.200)	(10.200)	(10.200)	(30.600)
	SALARY			(25.481)	(25.481)	(25.481)	(76.443)
8.	COST SAVINGS MILCON			(3.900)			(3.900)
9.	BASE OPERATION SUPP			(4.400)	(4.400)	(4.400)	(13.200)
	YEARLY COST			27.233			27.233
	YEARLY SAVINGS			(47.023)	(43.123)	(43.123)	(133.269)
	DELTA			(19.790)	(43.123)	(43.123)	(106.036)

3. CAPABILITY/DEVELOPMENT. TO CLOSE SAAD, A $ 4.5 MILLION RENOVATION OF A WAREHOUSE WOULD BE REQUIRED FOR THE NIGHT VISION - ELECTRO OPTICS REPAIR FACILITY AT ANNISTON ARMY DEPOT. TO ENSURE ARMY READINESS DURING THE TRANSFER OF WORKLOAD FROM SAAD TO TOAD, CERTAIN REPARABLES COULD REQUIRE SHORT TERM CONTRACTOR SUPPORT. THE ADDITIONAL COST OF PLACING 48,328 DIRECT LABOR HOURS OF NIGHT VISION - ELECTRO OPTICS WORKLOAD ON NATIONAL MAINTENANCE CONTRACT FOR SIX MONTHS IS APPROXIMATELY $ 1.5 MILLION. ARMY IS CURRENTLY STUDYING HOW TO ACCELERATE THIS WORKLOAD PRIOR TO CLOSURE TO AVOID SAID COST. TO MOVE GROUND COMMUNICATIONS AND ELECTRONICS FROM SAAD WOULD RESULT IN SEVERAL RELATED DEPOT FACILITIES BEING CLOSED AT A COST OF $ 56,448.

4. TRANSPORTATION CHANGE. WHILE THE ARMY PRESENTLY MAINTAINS AN EAST COAST AND A WEST COAST COMMUNICATIONS-ELECTRONICS REPAIR FACILITY, WORKLOAD IS NOT ASSIGNED BASED ON GEOGRAPHY. ESSENTIALLY, CUSTOMER LOCATION AND WEAPON SYSTEM DENSITY HAVE HAD NO INFLUENCE ON THE ARMY'S ASSIGNMENT OF THE GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD TO EITHER SAAD OR TOAD. BASED ON THE TRANSPORTATION COST MODEL USING MILITARY TRAFFIC MANAGEMENT COMMAND DATA AND THE ACTUAL WORLDWIDE SYSTEM LOCATIONS AND DENSITIES, THE RELOCATION OF THE SAAD WORKLOAD TO THE EAST COAST, I.E., TOAD, WOULD SAVE $ 3,042,042 PER YEAR IN TRANSPORTATION CHARGES.

5. INVENTORY. COMMUNICATIONS - ELECTRONICS SUPPLIES PRESENTLY STORED AT SAAD AND HAVING AN ACTIVE DEMAND STATUS WOULD HAVE TO BE RELOCATED TO TOAD. CHARGES WERE CALCULATED USING ENGINEERING ESTIMATES CONSISTENT WITH THE MILITARY TRAFFIC MANAGEMENT COMMAND COSTS FOR TRANSPORTATION. ACTIVE STOCKS ASSOCIATED WITH GROUND COMMUNICATIONS AND ELECTRONICS WOULD COST $ 577,150 TO RELOCATE TO TOAD.

6. NEW PERSONNEL. COSTS INCORPORATED IN THIS ELEMENT ENCOMPASS RECRUITMENT EXPENSES TO BE INCURRED AT TOAD AND THE PRODUCTIVITY LAG RESULTING FROM THE APPLICATION OF THE LEARNING CURVE TO THE NEWLY HIRED TOAD EMPLOYEES. TO HIRE 463 PERSONNEL AT TOAD, AT A PROCESSING COST OF $ 116.97 EACH, AND 278 EMPLOYEES AT ANAD, AT A PROCESSING COST OF $ 415.00 EACH, THE TOTAL EXPENSE WOULD BE $ 169,527. THE PRODUCTIVITY LAG ASSOCIATED WITH THESE EMPLOYEES WOULD COST $ 831,188 FOR A 25% FACTOR OF THE $ 17.05 DIRECT LABOR WAGE TIMES THE 195,000 DIRECT LABOR HOURS FOR GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD DESIGNATED FOR TRANSFER.

7. CHANGE IN PRODUCTION COST. OVERHEAD, DIFFERENTIALS, AND SALARY SAVINGS COMPRISE THE REDUCTION IN PRODUCTION COSTS. THE MOVEMENT OF THE WORKLOAD FROM TOAD TO ANAD RESULTS IN THE ELIMINATION OF SALARIES TOTALING $ 25.2 MILLION FOR CIVILIANS AND $ 281,000 FOR MILITARY. NATURALLY, THE WAGE GRADE LABOR RATE IS SIGNIFICANTLY LOWER AT TOAD AND ANAD THAN AT SAAD AND SM-ALC. THESE LOWER COSTS OF DOING BUSINESS EQUATE TO $ 10.2 MILLION IN ADDITIONAL SAVINGS BY RELOCATING GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD FROM THE WEST COAST TO TOAD AND ANAD. TOTAL COST OF PERFORMING THE GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD WAS COMPARED BETWEEN SAAD AND THE TOAD/ANAD ALTERNATIVE. AGGREGATE SAVINGS WAS ACCOUNTED TO THE NUMBER OF ELIMINATED POSITIONS, THE LOWER COST OF LABOR AND OVERHEAD AT TOAD/ANAD, AND THE AVOIDANCE OF THE BASE OPERATIONS EXPENSE OF SAAD. HOURLY RATE COMPARISONS WERE PERFORMED AMONG DEPOTS TO EXHIBIT THE BREAK-OUT OF EACH CATEGORY OF EXPENSE.

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

OPTION 2 SAAD GCE WORKLOAD TO SM-ALC

(INCLUDING ELECTRO-OPTICS)

APPENDIX (3)

(HOURS IN THOUSANDS)

DEPOT	FY 91 FUNDED WKLD	FY 91 @1615 CAP	FY 91 CAPACITY % UTIL	FY 92 FUNDED WKLD	FY 92 @1615 CAP	FY 92 CAPACITY % UTIL	FY 93 FUNDED WKLD	FY 93 @1615 CAP	FY 93 CAPACITY % UTIL	FY 94 FUNDED WKLD	FY 94 @1615 CAP	FY 94 CAPACITY % UTIL	FY 95 FUNDED WKLD	FY 95 @1615 CAP	FY 95 CAPACITY % UTIL
SAAD	975	2,394	40.7%	1,113	2,394	46.5%									
TOAD	1,907	3,859	49.4%	2,122	3,859	55.0%	2,144	4,570	46.9%	2,144	4,570	46.9%	2,144	4,570	46.9%
SM-ALC	1,194	1,777	67.2%	1,265	1,777	71.2%	2,220	1,777	125.0%	2,196	1,777	123.6%	2,186	1,777	123.1%
USMC BAR	206	203	101.7%	170	164	103.4%	169	166	101.6%	170	166	102.2%	181	172	105.1%
USMC ALB	220	213	103.1%	247	238	103.8%	250	238	105.1%	251	240	104.7%	253	240	105.5%
NAD-PN	9	14	64.5%	9	14	65.7%	9	14	65.7%	9	23	38.3%	9	14	65.7%
NAD-JA	1	5	20.4%	1	5	20.4%	1	5	20.4%	1	5	20.4%	1	5	20.4%
NAD-NOR	4	19	20.2%	4	19	21.5%	4	19	21.5%	4	19	21.5%	4	19	21.5%
NESEC SD	16	25	62.9%	18	25	70.7%	19	25	74.7%	21	25	82.5%	23	25	90.4%
NESEC POR	2	4	51.1%	2	4	51.1%	2	4	51.1%	2	4	51.1%	2	4	51.1%
TOTALS	4,534	8,512	53.3%	4,951	8,498	58.3%	4,818	6,817	70.7%	4,798	6,829	70.3%	4,803	6,825	70.4%

DDMC SUB-GROUP FOR GCE
OPTION II NARRATIVE

Option II: To evaluate the cost data and impact of moving Sacramento Army Depot (SAAD) Ground Communication-Electronics (GCE) workload to Sacramento Air Logistics Center (SM-ALC).

Option II Study Limitation: The Air Force has analyzed and accepted cost data associated with moving the SAAD GCE workload to Tobyhanna Army Depot (TOAD) (approximately 2000 miles), provided by the Army, in determining commensurate costs to move the SAAD workload to SM-ALC (approximately 11 miles).

Exception: Although the Rotary Wing Study approved by the DDMC was supposed to be our guide in performing this study, the Marine Corps (Chair) and the Army advocate using composite depot labor rates in determining cost savings within the Change in Production Cost category of the GCE Study. The Rotary Wing Study acknowledged the disparity in computing labor rates between the services and leveled the competition through use of an agreed to average annual salary and percentage of reduction in overhead personnel to arrive at the Change in Production Cost. The Air Force disagrees with the GCE Study methodology of using composite rates for cost comparisons.

1. Assumptions:

a. SM-ALC's industrial infrastructure (overhead skills and support facilities) will readily accommodate the SAAD requirements.

b. If Option II is not selected, SM-ALC facilities will be laid away to increase facility utilization to approximately 100 percent. An initial (draft) layaway plan is enclosed as Table, reference Table X(3).

2. Cost/savings: Moving SAAD's GCE workload to SM-ALC would net first years savings of at least $ 11.2M. Net five year savings would be at least $ 32.5M. As stated in the above note, the cost/savings computations for Option II are derived from a factorial analysis of the Army data. A specific breakdown of the cost elements may be found beginning on page 12 of this report.

a. In addition to providing all typical GCE depot support, SM-ALC has several unique capabilities which enhance quality and efficiencies and reduce depot support costs.

(1) Application of neutron radiography to display multilayer circuit card configuration at each level expedites reverse engineering costs by approximately 500 percent.

(2) Use of plastic media to remove electronic component and shelter finishes permits removal of surface coatings without affecting layers of corrosion treatment which reduces the time

field in the event of war. The risk is low because movement of personnel within the same geographic community ensures 100 percent re-employment of system experts. It also minimizes the risk of damage to/loss of sensitive electronic test equipment and parts (movement is only 11 miles). Conversely, movement of personnel and materiel over 2000 miles results in higher risks associated with personnel severance, PCS, recruitment and training and damage to/loss of sensitive electronic test equipment and parts. Option II ensures DoD's ability to provide adequate quantities of war readiness materiel to the field in the event of war.

5. Option II potential facility layaways:

a. If not selected, results in layaway of DoD's most modern GCE support facilities.

b. Potential layaway plan is at Table X(3).

c. The draft layaway plan results in a first year cost of $ 596,967 and would yield an annual payment against that debt of $ 35,860. At the five year interval the net result would be a debt of $ 453,527. The break even point would be attained in 17.6 years.

6. Option II pros & cons:

Pros:

a. The conservative cost analysis applied to examine the SAAD transfer to SM-ALC renders an immediate (first year) payback generation of at least $ 11.2 million and a five year savings of at least $ 35.9 million.

b. Although other alternatives (applying other data to arrive at changes in production cost) could indicate a greater cost savings, it is indisputable that movement of the SAAD workload to SM-ALC would provide the lowest execution cost. It is faster, easier, causes less disruption to mission capability and is more economical to move SAAD personnel and equipment 11 miles than it would be to other CONUS locations.

c. The movement of SAAD GCE workload to SM-ALC would provide the lowest risk to negative impact on users. Retention of the current SAAD electronic technicians would virtually eliminate any need to recruit, train or contend with a reduction in production capability (learning curve), which would be inherent if the workloads were moved to other CONUS locations. With the United States on the brink of a war in the Middle East, maintaining DoD's war mission depot logistics support system at a high level of readiness is imperative. Retention of the SAAD electronic system experts at SM-ALC will insure an uninterrupted depot logistics support system.

strategic merit. History has demonstrated that the United States has and may again be threatened or need to support allies in the Pacific theater. Thus, geographic and strategic depot proximity is fluid and locations on both seaboards would be beneficial.

i. Moving SAAD's GCE to SM-ALC increases DoD inter-servicing by 28 percent. Analysis of the latest Joint Policy Coordinating Group for Depot Maintenance Program Objective Summary, Table A-1, indicates there is an inter-servicing trade deficit between the Air Force and Army; currently the Air Force inter-services 9.8 hours of work to the Army for every 1.0 hour of work the Army returns to the Air Force. The same document indicates the total current inter-servicing workload for FY88 (latest data available) was 3,646,979 direct labor hours. Movement of the SAAD GCE workload to SM-ALC would increase the total DoD inter-servicing by 1,031,000 direct labor hours or 28 percent.

j. **Large Radars:** SM-ALC is the Inventory Control Point (ICP) and depot for most large radars in the DoD inventory. Examples include the FPS-117, which is an early warning system, and the TPN-19 and GPN-22 radars, which are GCE. These systems have many similar components that are repaired by the same Electronic Mechanics using the same facilities and support equipment. The Electronic Engineers and Electronic Technicians may also be the same for certain components. These components include such things as wave guides, receivers, transmitters, and phase shifters. Adding the SAAD GCE would add further economies (increased facility utilization and decreased indirect and overhead ratios) to DoD's largest radar repair capability and expand the skills base used for early warning and space systems. These core skills, facilities and equipment must be maintained at SM-ALC for accomplishment of the Space and Early Warning workloads.

k. **Electronic Assemblies:** SM-ALC has the most sophisticated and diverse facilities for repair and manufacture of electronic assemblies in DoD, and in some cases, in the world. Capabilities include printed circuit board manufacture, VHSIC insertion, fiber optic insertion and repair, nuclear hardness testing and certification, and reverse engineering. These capabilities, as well as the Electronic Mechanics, Engineers and Technicians who repair them, are shared among all of the electronic workloads at SM-ALC, including avionics, space and GCE systems. For example, SM-ALC has a unique capability in the neutron radiography facility that is used to provide an image of the interior structure of printed circuit cards for reverse engineering and manufacture. This facility is also used to test and certify the nuclear hardness of specific electronic components. Adding the SAAD GCE workloads to SM-ALC could only improve the response times and overall service to DoD's war fighting capability.

l. Many of the SM-ALC's GCE systems are software intensive. In order to properly support these systems, ICP responsibilities (primarily sustaining engineering), hardware mainte-

area of microelectronics. SM-ALC has the microscopes, CAD CAM systems, and testers required to duplicate schematics and determine function down to the component level. Using the Neutron Radiography equipment, SM-ALC has the capability to duplicate multi-layer circuit boards. SM-ALC also has the capability for computer simulation to test the operation of components. SM-ALC also has a VHSIC tester that provides a unique test capability for VHSIC chips. No other DoD agency has the capabilities that SM-ALC has in the area of microelectronics reverse engineering. SM-ALC provides this service to Army and Navy activities. The practice of reverse engineering is not prevalent in industry. There are few no company that provides this service. The Sacramento area has a high proportion of highly skilled electronics and software professionals. These skills are being developed in the Sacramento area as well as being imported from the "Silicon Valley" of the San Francisco Bay area. Many firms (HP, INTEL, etc.) reside in this area, thus providing a breeding ground for skills not found in the requisite numbers elsewhere. SM-ALC has made excellent use of this resource.

MICROELECTRONICS TECHNOLOGY CENTER
13,000 square feet Class 100 clean room $35,000,000.00 capital investment 36 Electronics Applications Engineers

(2) PWB MANUFACTURE: SM-ALC's printed wire board manufacture facility can manufacture, test, and repair all types of circuit board assemblies found in industry today. Testing is possible from bare board through finished assembly, using Xray and/or ATE, depending on requirement.

PWBA MANUFACTURING AT SM-ALC (overview)	
15,000 square feet $9,797,000.00 capital investment Quality Assurance/Mil Spec Compliance Lab	
PWBA TECHNOLOGIES SUPPORTED	
Surface Mount Technology Tape Automated Bonding Circuit On Board	Fine Pitch Technology Multi Chip Module Plated Through Hole
TYPES OF PWB's MANUFACTURED AT SM-ALC	
single sided flex multilayer	double sided ceramic

hazardous material abatement program has achieved a 57% reduction in hazardous material, surpassing the DoD goal of 50% by 1992. Plastic media blasting (as opposed to chemical wash), Cadmium recovery, and high pressure water blasting are all processes used in support of GCE, in place at SM-ALC.

(5) ANTENNA SUPPORT: Antenna support at SM-ALC involves in-system testing capability for phased array antennas, such as FPS-117, Anechoic chamber testing on antennas such the MSQ-118, and antenna manufacture, for antennas such as the spiral antenna used on the ALQ-133, part of Army's Quicklook program. As part of the initial input on antenna design, SM-ALC technicians and engineers have worked with Westinghouse on the antenna development for the TPS-75, an ultra low sidelobe antenna concept. In addition, the military runway at SM-ALC provides an inexhaustible source of live targets for final depot test of repaired or overhauled antennas.

(6) TPS DEVELOPMENT: GCE depot support requires extensive Test Program Set (TPS) development, and SM-ALC has an extensive GCE TPS development facility capable of meeting the demands of supporting complex GCE equipment. Complete TPS's for GCE systems, sub-systems, LRU's, and SRU's are developed at SM-ALC. TPS's developed by SM-ALC include all documentation, software, and interface test adapters. Using techniques such as signature, guided probe, or nodal analysis the TPS will take the technician down to the piece/part level. With TPS development done in the same location as the repair, TPS support is readily available. With GCE systems being modified rather than replaced, TPSs need to be updated, as required. At SM-ALC the TPS engineers work with the repair technicians to accomplish TPS modifications in a timely manner. This consolidated effort results in minimal lag time for support, and a timely audit trail for documenting upgrades to the T.O. system. The success of the TPS capabilities at SM-ALC have garnered customers world-wide: Saudi Arabia and Canada have contracted with SM-ALC for TPS development on their State-of-the-Art GCE systems.

TPS DEVELOPMENT AT SM-ALC (overview)
30,000 square feet of facilities
$45,000,000.00 capital investment
41 separate ATE systems
72% of personnel have EE degrees

(7) ADVANCED COMPOSITES: The Advanced Composites Program Office (ACPO) was established at McClellan in 1983. The role of this office is to establish a capability to apply ad-

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

OPTION 3 -- MOVE SAAD AND SM-ALC GCE WORKLOAD TO TOAD

(SAAD ELECTRO OPTICS MOVES TO ANAD)

APPENDIX (5)

(HOURS IN THOUSANDS)

DEPOT	FY 91 FUNDED WKLD	FY 91 1615 CAP	FY 91 CAPACITY % UTIL	FY 92 FUNDED WKLD	FY 92 1615 CAP	FY 92 CAPACITY % UTIL	FY 93 FUNDED WKLD	FY 93 1615 CAP	FY 93 CAPACITY % UTIL	FY 94 FUNDED WKLD	FY 94 1615 CAP	FY 94 CAPACITY % UTIL	FY 95 FUNDED WKLD	FY 95 1615 CAP	FY 95 CAPACITY % UTIL
SAAD	975	2,394	40.73%	1,113	2,394	46.49%									
TOAD	1,907	3,859	49.42%	2,122	3,859	54.99%	4,263	4,570	93.29%	4,239	4,570	92.76%	4,229	4,570	92.55%
SM-ALC	1,194	1,777	67.19%	1,265	1,777	71.19%									
USMC BAR	206	203	101.67%	170	164	103.38%	169	166	101.57%	170	166	102.17%	181	172	105.07%
USMC ALB	220	213	103.10%	247	238	103.85%	250	238	105.11%	251	240	104.67%	253	240	105.50%
NAD-PN	9	14	64.5%	9	14	65.7%	9	14	65.7%	9	23	38.3%	9	14	65.7%
NAD-JA	1	5	20.4%	1	5	20.4%	1	5	20.4%	1	5	20.4%	1	5	20.4%
NAD-NOR	4	19	20.2%	4	19	21.5%	4	19	21.5%	4	19	21.5%	4	19	21.5%
NESEC SD	16	25	62.9%	18	25	70.7%	19	25	74.7%	21	25	82.5%	23	25	90.4%
NESEC POR	2	4	51.1%	2	4	51.1%	2	4	51.1%	2	4	51.1%	2	4	51.1%
ANAD							101	101	100.0%	101	101	100.0%	101	101	100.0%
TOTALS	4,534	8,513	53.3%	4,951	8,499	58.3%	4,818	5,141	93.7%	4,798	5,153	93.1%	4,803	5,149	93.3%

Air Force Input

GROUND COMMUNICATIONS-ELECTRONICS STUDY

OPTION III: SM-ALC/SAAD GCE WORKLOAD TO TOAD

1. ASSUMPTIONS:

Based on current data available, the following major assumptions were made:

a. Performance and quality are roughly equivalent at SAAD, TOAD, and SM-ALC.

b. Maximum capacity is defined in terms of direct manhours (1615/person/year X .95) that are calculated based on the maximum number of direct labor personnel that can effectively work in a single shift within the associated shop category.

c. SM-ALC is the only depot being considered with on-base access to a runway, a Military Air Lift Command terminal, a dock and crane in a deep water port, and a rail spur.

d. Transfer of SM-ALC's GCE workload to another location would not result in nor necessitate closure of SM-ALC or McClellan AFB.

2. COST/SAVINGS: (SEE ATTACHED TABLE)

a. There is no cost advantage to moving SM-ALC's GCE workload to TOAD. Over a three year period, the net loss to the government would be
$ 109.5M.

b. Combining SM-ALC's workload with that of SAAD for transfer to TOAD masks the cost data; cost benefit associated with the SAAD move and theexhorbitant cost of the SM-ALC move. Therefore, the attached chart breaks out the SAAD and SM-ALC figures separately.

3. WORKLOAD CAPACITY IMPACT:

Transferring SM-ALC workload to TOAD would have an adverse impact on DoD capacity utilization. Although a portion of the SM-ALC GCE facilities could be closed (laid away), the balance of the SM-ALC facilities would need to remain open to perform Space, Avionics, Early Warning and other electronic workloads, and would do so at a reduced capacity utilization.

4. MOBILITY/SURGE/CORE/READINESS IMPACTS:

a. SM-ALC's GCE workload has always been used as a significant contributor to the center's "Critical Mass" (that amount/type of peacetime workload needed to sustain a workforce capable of meeting wartime requirements). Since most GCE is low surge, it is used to offset the center's high surge workloads for wartime planning. Loss of the GCE would lead to a plethora of high surge workload at SM-ALC and thus a surge imbalance.

Sacramento has a deep water Port and McClellan AFB has a dock with crane at the deep water channel leading to the Pacific Ocean for sea shipments. Depot support response time would be adversely impacted by not having these transportation resources readily available, as would be the case in a workload transfer.

5. POTENTIAL FACILITY LAYAWAYS: Draft layaway analysis results in a computed $ 43,434 first year savings (see attached spreadsheet).

6. PROs AND CONs:

a. PRO: Increased facility utilization at TOAD.

b. CONs

(1) Transferring SM-ALC's GCE workload to TOAD would be very costly. It would take more than 22 years for the 25 percent (indirect and inter-servicing efficiency) differences to amortize the initial cost of this option.

(2) Removing 1.1 M manhours of direct labor from SM-ALC would increase the overhead rate for remaining workloads.

(3) Removal of this workload from SM-ALC would degrade the skill base needed to support Space and other electronic workloads at SM-ALC.

(4) There will be a duplication of facilities and equipment between SM-ALC and TOAD. Many facilities must remain open to support space and other electronics workloads that SM-ALC would continue to repair in the event of a GCE transfer. Many pieces of equipment must be duplicated to support ICP engineering, software and system integration functions.

(5) Separation of hardware maintenance from software maintenance and Integration Support Facilities is inefficient and will reduce customer support and readiness.

(6) Transferring SM-ALC workload to TOAD would have an adverse impact on DoD capacity utilization. Although a portion of the SM-ALC GCE facilities could be closed (laid away), the balance of the SM-ALC facilities would need to remain open to perform Space, Avionics, Early Warning and other electronic workloads, and would do so at a reduced capacity utilization.

(7) SM-ALC's GCE workload has always been used as a significant contributor to the center's "Critical Mass" (that amount/type of peacetime workload needed to sustain a workforce capable of meeting wartime requirements). Since most GCE is low surge, it is used to offset the center's high surge workloads for wartime planning. Loss of the GCE would lead to a plethora of high surge workload at SM-ALC and thus a surge imbalance.

(8) SM-ALC is the primary DoD Inventory Control Point (ICP) and depot for space programs. This is due to the similarity of skill and facility requirements for Ground Communication-

capability to duplicate multi-layer circuit boards. SM-ALC also has the capability for computer simulation to test the operation of components. SM-ALC also has a VHSIC tester that provides a unique test capability for VHSIC chips. No other DoD agency has the capabilities that SM-ALC has in the area of microelectronics reverse engineering. SM-ALC provides this service to Army and Navy activities. The practice of reverse engineering is not prevalent in industry. There is no company that routinely provides this service. It is unrealistic to assume that these capabilities could be replaced or relocated to one of the existing DoD logistics activities. The Sacramento area has a high proportion of highly skilled electronics and software professionals. These skills are being developed in the Sacramento area as well as being imported from the "Silicon Valley" of the San Francisco Bay area. Many firms are moving into this area, thus providing a breeding ground for skills not found in the requisite numbers elsewhere. SM-ALC has made excellent use of this resource.

MICROELECTRONICS TECHNOLOGY CENTER
13,000 square feet Class 100 clean room $35,000,000.00 capital investment 36 Electronics Applications Engineers

(b) PWB MANUFACTURE: SM-ALC's printed wire board manufacture facility can manufacture, test, and repair all types of circuit board assemblies found in industry today. Testing is possible from bare board through finished assembly, using Xray and/or ATE, depending on requirement.

PWBA MANUFACTURING AT SM-ALC (overview)	
15,000 square feet $9,797,000.00 capital investment Quality Assurance/Mil Spec Compliance Lab	
PWBA TECHNOLOGIES SUPPORTED	
Surface Mount Technology Tape Automated Bonding Circuit On Board	Fine Pitch Technology Multi Chip Module Plated Through Hole
TYPES OF PWB's MANUFACTURED AT SM-ALC	
single sided flex multilayer	double sided ceramic

TPS DEVELOPMENT AT SM-ALC (overview)
30,000 square feet of facilities
$45,000,000.00 capital investment
41 separate ATE systems
72% of personnel have EE degrees

(g) ADVANCED COMPOSITES: The Advanced Composites Program Office (ACPO) was established at McClellan in 1983. The role of this office is to establish a capability to apply advanced composites technology and then to export this technology to other DoD activities. Work done in advanced composites at McClellan is on the leading edge of this technology. The ACPO provides training to Air Force personnel in 6 major areas: Composite Materials, Basics of Structural Design, Processing/Quality Control, Repair Techniques, Composite Tooling, and Injection Molding of Thermoplastics. The office fully supports Three-dimensional CAD/CAM/CIM, Drafting, Solids Modeling, Finite Element Analysis, Whiffle Design and Five-Axis Numerical Control Programming. The operational test facility is capable of simulating aerodynamic heating (up to 500° F while applying stress. The Thermoplastic Injection Molding Facility can manufacture items with a 500 square inch, single plane surface area and a maximum weight of 20 pounds, clamped with up to 1500 tons of pressure.

(12) The requirements for successful depot activation cross the lines of engineering, planning, logistics and technology. These skills are amassed through training, both formal and on-the-job, and experience. The depot activation team at SM-ALC is synergistic, and this would be lost when workloads are transferred. Because of the many issues that go into successful support a GCE system, SM-ALC has a support organization that specifically addresses the following issues of logistic support:

(a) SATAF: As part of the Site Activation Task Force, team members from SM-ALC work towards a successful system turnover. By having technicians on site, future support problems are noted and planned for.

(b) DMAWG: As part of the Depot Activation Working Group, planning is started for adequate depot level support in a timely manner. This way, need for contract maintenance support in minimized, helping the program office stay in budget.

(c) ILSWG: As part of the Integrated Logistics Support Working Group, SM-ALC team members will evaluate data, such as Mean Time Between Failures (MTBF) and the Initial Spares Support List (ISSL). By using their technical background, a comparison is made as to whether the MTBF relates to the ISSL for

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

OPTION III - TRANSFER SAAD AND SM-ALC GCE WORKLOAD TO TOAD

COST ANALYSIS - AIR FORCE INPUT

(NOTE: Data relates only to movement of SM-ALC workload. Additional costs associated with SAAD should be obtained from the Army for the final report. However, each move should be considered separately to avoid masking the efficiencies or inefficiencies of the other.)

1. RELOCATION OF PRODUCTION EQUIPMENT: The plant equipment located at SM-ALC for use with GCE depot level maintenance was reviewed by SM-ALC engineers and equipment specialists. Only peculiar support equipment was identified for possible transfer. That equipment that was exclusively used for workload identified as a candidate for transfer was evaluated for shipping requirements, with the following results:

TEARDOWN/PACK/UNPACK/SETUP/CALIBRATE	$3,245,000
SHIPPING	400,000
TOTAL:	$3,645,000

2. PERSONNEL REDISTRIBUTION: The cost to redistribute SM-ALC's GCE depot maintenance workforce includes the expenses delineated below. Available employment in the Sacramento area is predominantly service oriented. The vast preponderance of industrial jobs are with DoD either at SM-ALC or SAAD. Electronics firms in the area offer predominantly assembly jobs, for which displaced SM-ALC employees would be over qualified. Therefore, it would be at least 24 weeks before most of the displaced employees would find suitable employment. It is also expected that only 5% of the displaced employees would accept offers to transfer to Pennsylvania. It has been our experience that blue collar workers are reluctant to leave the area. Most families are dual-income, and would prefer to operate for 6 months to a year on a single income awaiting suitable employment in the area. No military relocations are expected from SM-ALC.

TOTAL SM-ALC GCE EMPLOYEES:	834	
NUMBER OF TRANSFERS:	42	(.05 * 834)
NUMBER SEVERED:	792	
UNEMPLOYMENT PERIOD:	24	WEEKS
AVERAGE AGE:	44	
AVERAGE YEARS SERVICE:	14	
AVERAGE SALARY:	$33,000	

UNEMPLOYMENT COMPENSATION:	$ 3.612	(683 * 24 * $190 PER WEEK)
SEVERANCE PAY:	11.979	(683 * $15,125 PER PERSON)
PCS COST:	1.344	(36 * $32,000 PER PERSON)
TOTAL COST:	$16.935	

3. CAPABILITY DEVELOPMENT:

a. It is important to note that facilities for C-E commodities are not suitable for Other Major End Item (OMEI) overhaul of

portation costs would increase by 336.6K dollars per year; or approximately 1.0M dollars over a three year time frame.

Cost for Transportation Change: $336.6K per year

5. INVENTORY: Electronics supplies used exclusively for SM-ALC's GCE depot level repair and overhaul would be transferred to Tobyhanna. Supplies that are common to other workloads at SM-ALC would be retained at SM-ALC and would have to be duplicated at Tobyhanna. ?

COST OF RELOCATION:	$ 400,000
COST OF DUPLICATION:	1,320,000
TOTAL:	$1,720,000

?

6. NEW PERSONNEL:

a. Costs associated with this element include recruitment expenses, training costs, ICS during transfer and recruitment phase at TOAD, and productivity loss resulting from new personnel. Extensive training requirements are associated with the type of workload being transferred (specifically the OMEI workload) that currently exists only at SM-ALC. It is estimated that 50% of the new-hires at Tobyhanna Army Depot would require training of this magnitude. An example of training is described below for the TPS-43 Radar:

GCE SKILLS REVIEW TPS-43 Radar Support			
Skills & training	PE's	% of direct labor	
Integrated Systems mechanics (WG-12)	7	25%	
Electronics mechanics systems overhaul (WG-11)	15	54%	
Electronics mechanic MISTR support (WG-08)	6	21%	
TPS-43 direct labor	28	100%	
Formal System training	22	79%	course length: 800 hrs.

b. COSTS:

RECRUITMENT:	$ .253	792 PEOPLE @ $320 PER PERSON
TRAINING (SALARIES)	5.401	792 * 50% * 800 HRS * $17.05/HR
TRAINING (TRAINERS)	.683	27,320 INS HRS * $25.00/HR
ICS COST	32.000	SPM ESTIMATE
PRODUCTION LAG:	4.805	1,138,000 HRS * .25 * $17.05/HR
TOTAL:	$43.143	

?

COSTS/SAVINGS SUMMARY - SAAD & SM-ALC TO TOAD
(DOLLARS IN MILLIONS)

CATEGORY	SAAD	SM-ALC	TOTAL
1. RELOCATION OF EQUIP		$3.6	
2. PERSONNEL REDISTRIB			
A. UNEMPLOYMENT		$3.1	
B. SEVERANCE		$10.3	
C. PCS - CIV		$1.2	
D. PCS - MIL		$.0	
PERSONNEL SUB-TOTAL		$14.6	
3. CAPABILITY DEVELOPMENT			
A. FACILITIES		$5.3	
B. EQUIPMENT		$49.5	
C. TRANSPORTATION		$1.0	
D. FACILITY MOD		$.0	
CAP SUB-TOTAL		$56.4	
4. TRANSPORTATION CHANGE	$.0	$.3	$.0
5. INVENTORY MOVE		$1.7	
6. NEW PERSONNEL			
A. PRODUCTIVITY LAG		$4.8	
B. RECRUITMENT		$.2	
C. TRAINING		$5.4	
D. PROD SHUTDOWN COST		$30.2	
NEW PERS SUB-TOTAL	$.0	$40.6	$.0
7. CHANGE IN PROD COST			
A. INDIRECT		$-.6	
B. INTER-SERVICING		$-2.0	
CHANGE SUB-TOTAL		$-2.6	
8. COST SAVINGS MILCON		$.0	
9. CHANGE IN BOS		$.0	

	93	94	95	TOTAL
COSTS	116.6	.3	.4	117.3
SAVINGS	(2.6)	(2.6)	(2.6)	(7.8)
TOTAL	114.0	(2.3)	(2.2)	109.5

GROUND COMMUNICATIONS-ELECTRONICS STUDY

OPTION III - MOVEMENT OF GC&E FROM SAAD AND SM/ALC TO TOAD

I. ASSUMPTIONS

a. Sacramento Army Depot will close with GC&E workload primarily transferring to Tobyhanna Army Depot.

b. The Sacramento Army Depot electro-optics workload will transfer to Anniston Army Depot.

c. SM/ALC GC&E workload will transfer to TOAD.

d. The Army workload was derived from the Budget Strat for FY91-93. FY94 and FY95 workload was straight-lined from FY93. Reimbursable workload was based on historical data.

e. SM/ALC workload data was provided by SM/ALC representatives.

f. Workload was not decremented based on a declining defense budget.

g. Maximum capacity is defined by 1615 direct labor man-hours per year x the number of work positions x .95 and are calculated based on the maximum number of direct labor personnel that can work a single shift.

II. WORKLOAD CAPACITY/IMPACT

a. Since these workload transfers occur in FY93, TOAD's total capacity will be sufficient to absorb both the SAAD and SM/ALC workloads while still leaving adequate surge capacity/capability.

b. Tobyhanna Army Depot's total capacity will increase to 6.1 million man-hours with GC&E capacity of 4.6 million man-hours in FY93. This increased capacity is attributable to two congressionally approved military construction projects; e.g. a 178,000 square foot Communications Security (COMSEC) Facility and a 67,000 square foot Satellite Communications Mission Facility.

c. In computing capacity, it is important to recognize that GC&E is a theoretical sub-category of the C-E commodity group. In practice, there is much commonality between the two. The same types of personnel skills, test equipment, and workplace are required to support C-E workload. For these reasons, GC&E capacity and C-E capacity can be considered the same.

III. COST SAVINGS

a. Transfer of SAAD's and SM/ALC's workload to TOAD results in a DOD savings of $232,478,000 during the period FY93-95. Tobyhanna Army Depot's substantially lower operating costs are reflected in its highly competitive bid rate (lowest in the U.S. Army Depot System Command) which easily overcomes the one-time costs incurred by the SAAD and SM/ALC closure.

b. Tobyhanna's competitive bid rate equates to a lower operating cost. Contributing factors include wage grade locality pay differences, organizational structure, direct to indirect ratios, direct labor yield, grade

d. Readiness to the Army will be enhanced because of the consolidation of workloads. This is due to the following:

(1) Availability of a larger electronic skill base capable of supporting all CE commodities.

(2) The commonality of repair parts and test equipment.

(3) Reduced transportation time due from the proximity of users.

e. The SAAD and SM/ALC to TOAD option would clearly satisfy the Army's and the Air Forces's "core" requirements.

f. This workload would be efficiently transitioned to TOAD with no disruption in customer services due to a phased-in approach and advance preparation at the gaining installation.

g. Tobyhanna can reacquire 19,800 acres of adjacent land for expansion purposes in the event of any national emergency.

V. POTENTIAL LAYAWAY

Potential layaway of buildings at SAAD for mobilization would result in the retention of 201,828 sq. ft. of work space and a savings of _____. Depot plant equipment which has not been transferred to TOAD could remain onsite and be included in the layaway.

VI. PROS AND CONS

a. Consolidation of all of CC&E workload at TOAD will result in a DOD Center of Technical Excellence for Communications-Electronics. The overall level of expertise would be greatly enhanced since all skills associated with C-E would be available at one location, thus facilitating technology sharing and creating a wider base of electronics knowledge. All of the depot's engineering skills would be singularly devoted to C-E, without the dilution of focus inherent in multi-commodity scenarios. This action will eliminate a significant duplication of facilities that presently exist within DOD. Industrial plant utilization rates will increase at all depots that receive transferred maintenance workload, and the utilization rates of depot maintenance facilities as an entire system will also increase due to the reduction in the overall capacity base.

b. This option allows DOD overall to take advantage of the significantly lower operating costs at TOAD rather than SAAD and SM/ALC—thus executing the work at a $232,478,000 savings over a 5-year period.

c. Tobyhanna will receive the largest portion of DOD's CC&E workload. Automated maintenance systems such as the Maintenance Shop Floor System and the Automated Storage and Retrieval System which are modern state-of-the-art information and material delivery systems to support this workload are already operational at TOAD.

i. Since 1975, TOAD has been responsible for providing satellite communications systems for the Tri-Services, White House, and NATO Signatories. TOAD provides support for both strategic and tactical satellite systems. By virtue of TOAD's experience and expertise in the field of satellite communications and involvement with the Space Technology Working Group, the depot was selected as CTX for Space Communications. TOAD maintains the engineering test bed for Satellite Digital Communications Subsystems (DCSS) for the Defense Satellite Communications Systems. TOAD has designed and built the majority of DCSS sites worldwide.

j. Maintenance Support Facilities/Capabilities

(1) Tobyhanna Army Depot performs complete repair/overhaul for a variety of GCA, surveillance, interrogator, weather and mortar locating radar Systems. Maintenance services include overhaul modification, and upgrade and performance testing to original manufacturing specifications. Furthermore, technical support is provided by an experienced staff of professional engineers who possess a high degree of expertise in the area of radar technology.

(2) In addition, TOAD operates two Radar Antenna Pattern Ranges. These ranges give TOAD the capability to align and test many types of radar antenna. Using a sophisticated AZ over EL over AZ Test Pedestal, the Radiation Patterns, in the form of Amplitude vs. Azimuth plots, in any axis as required, are calculated and hard copies are produced by chart recorders. Axis include the horizontal, vertical, and the rotor used in the AN/MPQ-4A Mortar Locating Radar System. Horizontal and Circular Polarization mode adjustments are done onsite and the antennas are retested. Once complete these antennas are put in optimum optical, mechanical and electrical calibration before being returned to the radar system for final operational testings.

(3) The radar systems that have antennas tested at these ranges are:

AN/TPN-18/18A Radar
AN/FPN-40 Radar
AN/FSQ-84/84A Radar
AN/TSQ-71B Air Traffic Control Central
AN/TPX-41/44/46 Interrogator
AN/MPQ-4A Mortar Locating Radar

(4) Tobyhanna performs final operational tests on all of the above mentioned Ground Control Approach Radars on our live target range. This includes conducting final precision approach of the overhauled radars with an aircraft to 300 ft. AGL. Accuracy of the radar is verified using a theodolite which has a .02 degree resolution. The surveillance modes and communication capabilities of these systems are checked during the flight test. This unique capability ensures high quality radar systems are fielded to Army aviation units.

o. Fiber Optics

(1) Tobyhanna has established repair/overhaul capability to support Fiber Optic workload. Specialized equipment necessary to manufacture/repair/overhaul fiber optic cable assemblies is in place. Equipment available includes a fusion splicer, optical time domain reflectometer (OTDR), cutting and polishing machines, optical attenuation test sets, and associated tools. Tobyhanna is presently fabricating new and/or upgrading through technology insertion previously built systems which use fiber optics extensively. These fabricated systems include: The Defense Satellite Communications System - Operations Control System (DOCS); the Digital Group Multiplexor for PM Multi-Service Communications System (AN/-173, AN/TRC-174, AN/TRC-175, and AN/TRC-138A); and the Remote Relay System AN/TSQ-144 (Guardrail V); Corps Theatre Automated Service Center II; (CTASCII); Relocatable Army Processors for Intelligence Data Europe (RAPIDE); and Mobile Battle Management Demonstrator.

(2) Tobyhanna designed, manufactured and completed systems integration of 30 AN/TSQ-146 Digital Group Multiplexer (DGM) shelter systems for the Air Force. This effort included fabrication, test, technical manual preparation and provisioning.

p. Satellite Communications - Tobyhanna Army Depot provides the following support services to Project Manager Satellite Communications (PM SATCOM).

(1) Organic Depot Level Maintenance (DLM) - TOAD serves as the prime mission depot providing DLM repair/overhaul support for virtually all SATCOM Strategic, Tactical and Control systems. As the prime mission depot, TOAD supports approximately 25 unique major Satellite Terminals and over 2,100 Line Replaceable Units (LRUs), Subassemblies and modules. Several specific examples include:

(a) Ground Mobile Forces (GMF) Satellite Terminals such as the AN/TSC-85/93, Air Force AN/TSC-94/100, AN/GSC-40 Combined Ground Command Post Terminal and AN/MSC-64 Force Terminal.

(b) Strategic Satellite Terminals to include the AN/FSC-78/79, AN/GSC-39, AN/GSC-49 Jam Resistant Secure Communications (JRSC) Terminal and the Digital Communications Satellite Subsystem (DCSS).

(c) AN/MSQ-114 Satellite Communications Monitoring and Control Central and subsystems of the Defense Satellite Communications System Operational Control System (DOCS).

(d) Future DLM workload includes the AN/GSC-52 State-of-the-Art Medium Terminal (SAMT), Single Channel Objective Tactical (SCOTT), Anti-Jam Control Modem (AJCM) and OM-73 Digital Data Modem.

(2) Design and Development and Manufacturing - TOAD serves as the prime system integrator for the DCSS. Our mission includes engineering design, fabrication, integration and testing of complex state-of-the-art systems deployed worldwide. Examples include the AN/MSC-66 DCSS Van, AN/MSC-74 Operations (OPS) Van and approximately 74 unique electronic racks and interfaces.

r. Tobyhanna also has its own in-house Technical Training School (Toby Tech) with 7 full-time instructors providing instruction in soldering, basic math, specialized test equipment, digital electronics, linear and digital integrated circuits to name a few. Tobyhanna has its own in-house 4-year Apprentice Program in electronics and metal trades. Employees enter the program as trainees and graduate as full-fledged journeymen. This was the first Department of Labor approved Electronics Apprentice Program within DOD.

s. The Center of Technical Excellence (CTX) concept was created within DESCOM to assure complete integration of the depot industrial base in support of the total acquisition life cycle. Under this concept, individual depots are designated as the CTX for selected major new weapon systems and must then provide intensive logistics management of the new system from inception thru fielding. Based on TOAD's capabilities and technical expertise, it is currently assigned 12 CTX programs - the most of any depot within DESCOM.

t. Total Quality Management - Tobyhanna Army Depot has always been recognized for its progressive and innovative management initiatives throughout the Army. In 1988 the depot committed itself to the implementation of TQM. The process began with a rigorous training program for all senior level managers. This included mandatory sessions by the Federal Quality Institute, Deming Seminars, Statistical Process Control Classes, and a host of other training that provided a common language for management. The efforts have set the stage for a number of process improvements. One of the depot's most critical processes, the acquisition cycle, was dissected and analyzed to identify and implement improvements through a Process Action Team. In addition to these formal process improvements, numerous experiments are being conducted within the Supply and Contracting arenas. To further develop our continuous improvement ability a TQM/Customer Relations session is taught monthly to the depot workforce. The TQM efforts and those of the depot's Quality Circles have been integrated to ensure a common direction.

u. In cooperation with East Stroudsburg University, VIASAR (Voice Interface for Automated Storage and Retrieval) has reduced material handling, keypunch errors contributing to increased productivity. VIASAR removes the need for stationery process stations allowing workers to move freely to the workload, induct data and correct errors immediately. Data is inducted via voice input and errors are isolated and reported via voice output eliminating labor intensive tasks by operators.

v. Printed Circuit Board Manufacturing - Tobyhanna Army Depot has the capability to fabricate single and double-sided Printed Circuit Boards (PCBs). Features of this operation include: a central reproduction area with imaging systems, state-of-the-art PCB fabrication equipment, component assembly workstations, and MIL-P-55110 test and inspection stations. Equipment necessary for manufacture of multi-layer printed circuit boards is presently being acquired. The design of PCBs is done with a Computer Vision Computer Aided Engineering System, allowing the efficient production of a Level III Drawing Package and any required Technical Manuals. Testing of the completed PCBs is accomplished with utilization of Automatic Test Equipment (ATE).

GROUND COMMUNICATION-ELECTRONICS STUDY
IMPACT OF MOVING SAAD AND SM/ALC TO TOAD
DOLLARS IN THOUSANDS

TAB	COST ELEMENT	FY91	FY92	FY93	FY94	FY95	COST
1.	RELOCATION OF PRODUCTION EQP						
	TSC			7.925			7.925
	SHIPPING			.112			.112
2.	PERSONNEL REDIST						
	UNEMP COMP			3.173			3.173
	SEVERANCE			15.879			15.879
	PCS-CIV			16.889			16.889
	PCS-MIL			.108			.108
3.	CAPABILITY/DEV						
	CONSTRUCTION			4.500			4.500
	TRANSITION			1.476			1.476
	CLOSE DOWN			.056			.056
4.	TRANSPORTION CHG			(6.084)	(6.084)	(6.084)	(18.252)
5.	INVENTORY			.577			.577
6.	NEW PERSONNEL						
	PRODUCTIVITY LAG			5.929			5.929
	RECRUIT EXP			.257			.257
7.	CHG IN PROD COST						
	OVERHEAD/DIFF			(41.108)	(41.108)	(41.108)	(123.324)
	SALARY			(43.561)	(43.561)	(43.561)	(130.683)
8.	COST SAVINGS MILCON			(3.900)			(3.900)
9.	BASE OPERATION SUPP			(4.400)	(4.400)	(4.400)	(13.200)
	YEARLY COST			56.881			56.881
	YEARLY SAVINGS			(99.053)	(95.153)	(95.153)	(289.359)
	DELTA			(42.172)	(95.153)	(95.153)	(232.478)

FOR SAAD WORKERS, UNEMPLOYMENT COMPENSATION PAYMENTS WERE CALCULATED AT $ 190.00 PER WEEK FOR 12 WEEKS FOR 434 SEPARATED EMPLOYEES FOR A COST OF $ 989,520. LIKEWISE, SEVERANCE PAY FOR SAAD WORKERS WAS DETERMINED FOR 12 WEEKS TO EQUAL $ 11,411 PER PERSON BASED ON AVERAGE AGE, SERVICE TIME, AND CURRENT PAY FOR A TOTAL COST OF $ 4,952,374. THOSE EMPLOYEES ELIGIBLE FOR PCS DUE TO A TRANSFER OF MISSION OR PRIORITY PLACEMENT RIGHTS TOTAL 364 CIVILIANS EQUATING TO $ 9.7 MILLION. MILITARY RELOCATIONS ASSOCIATED WITH MAINTENANCE ARE 9 FOR A TOTAL COST OF $ 108,000; HOWEVER, THIS EXPENSE COULD BE REDUCED IF NORMAL ROTATIONS ARE SCHEDULED TO COINCIDE WITH THE PLANNED DEPOT CLOSURE.

TO COST THE DISPLACED WORKERS AT SM-ALC, THE SAME CALCULATED COSTS PER EMPLOYEE WERE APPLIED USING THE SM-ALC ASSUMPTION THAT 80% OF THE ASSOCIATED WORKERS WOULD BE SEPARATED WITH THE REMAINING 20% BEING TRANSFERRED. FOR UNEMPLOYMENT COMPENSATION, 575 DIRECT AND 383 INDIRECT EMPLOYEES RELATED TO THE GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD WERE COSTED TO A TOTAL OF $ 2.183 MILLION. THE SAME NUMBER OF WORKERS WERE COSTED FOR SEVERANCE PAY PROJECTED TO TOTAL $ 10.931 MILLION. TO PCS THE REMAINING 20%, 144 DIRECT AND 96 INDIRECT DISPLACED EMPLOYEES WERE COSTED AT $ 30,000 EACH FOR $ 7.2 MILLION. NO MILITARY PCS REQUIREMENTS WERE INDENTIFIED BY SM-ALC.

3. CAPABILITY/DEVELOPMENT. TO CLOSE SAAD, A $ 4.5 MILLION RENOVATION OF A WAREHOUSE WOULD BE REQUIRED FOR THE NIGHT VISION - ELECTRO OPTICS REPAIR FACILITY AT ANNISTON ARMY DEPOT. TO ENSURE ARMY READINESS DURING THE TRANSFER OF WORKLOAD FROM SAAD TO TOAD, CERTAIN REPARABLES COULD REQUIRE SHORT TERM CONTRACTOR SUPPORT. THE ADDITIONAL COST OF PLACING 48,328 DIRECT LABOR HOURS OF NIGHT VISION - ELECTRO OPTICS WORKLOAD ON NATIONAL MAINTENANCE CONTRACT FOR SIX MONTHS IS APPROXIMATELY $ 1.5 MILLION. ARMY IS CURRENTLY STUDYING HOW TO ACCELERATE THIS WORKLOAD PRIOR TO CLOSURE TO AVOID SAID COST. TO MOVE GROUND COMMUNICATIONS AND ELECTRONICS FROM SAAD WOULD RESULT IN SEVERAL RELATED DEPOT FACILITIES BEING CLOSED AT A COST OF $ 56,448.

THE TRANSFER OF THE SM-ALC WORKLOAD TO TOAD WOULD NOT GENERATE CONSTRUCTION OR MAJOR RENOVATIONS REQUIREMENTS. NO TRANSITION COSTS WERE PROJECTED. THE AIR FORCE MAINTAINS THAT TRANSFERRING THE GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD TO TOAD WOULD NOT RESULT IN THE CLOSURE OF SM-ALC FACILITIES AND THEREFORE SUCH COSTS WERE AVOIDED.

4. TRANSPORTATION CHANGE. WHILE THE ARMY PRESENTLY MAINTAINS AN EAST COAST AND A WEST COAST COMMUNICATIONS-ELECTRONICS REPAIR FACILITY, WORKLOAD IS NOT ASSIGNED BASED ON GEOGRAPHY. ESSENTIALLY, CUSTOMER LOCATION AND WEAPON SYSTEM DENSITY HAVE HAD NO INFLUENCE ON THE ARMY'S ASSIGNMENT OF THE GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD TO EITHER SAAD OR TOAD. BASED ON THE TRANSPORTATION COST MODEL USING MILITARY TRAFFIC MANAGEMENT COMMAND DATA AND THE ACTUAL WORLDWIDE SYSTEM LOCATIONS AND DENSITIES, THE RELOCATION OF THE SAAD WORKLOAD TO THE EAST COAST, I.E., TOAD, WOULD SAVE $ 3,042,042 PER YEAR IN TRANSPORTATION CHARGES. THE SAME ADVOIDANCE OF TRANSPORTATION COSTS WAS ESTIMATED FOR THE AIR FORCE IN THE TRANSFER OF THE GROUND COMMUNICATIONS AND ELECTRONICS WORKLOAD TO FROM SM-ALC TO TOAD.

8. COST SAVINGS ON MILCON. THE MICROWAVE FACILITY PLANNED FOR SAAD IN FY 84 HAS BEEN DELAYED PENDING THE OUTCOME OF THE BASE CLOSURE STUDY OF THE DEPOT. THIS FACILITY WOULD NOT BE REQUIRED IF GROUND COMMUNICATIONS AND ELECTRONICS WOULD BE TRANSFERRED TO TOAD. NO SAVINGS ARE EXPECTED FROM SM-ALC SINCE NO NEW BUILDINGS ARE PLANNED TO SUPPORT THE WORKLOAD DESIGNATED FOR TRANSFER.

9. BASE OPERATIONS SUPPORT. THE CLOSURE OF SAAD WOULD ELIMINATE THE NEED FOR A $ 4.4 MILLION PORTION OF THE PAN AM WORLD SERVICES CONTRACT. NO REDUCTIONS IN BASE OPERATIONS AT SM-ALC ARE EXPECTED TO RESULT FROM THE TRANSFER.

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

OPTION 4 SM-ALC GCE WORKLOAD TO ALL OTHER AF-ALC'S

APPENDIX (8)

(HOURS IN THOUSANDS)

DEPOT	FY 91 FUNDED WKLD	FY 91 @1615 CAP	FY 91 CAPACITY % UTIL	FY 92 FUNDED WKLD	FY 92 @1615 CAP	FY 92 CAPACITY % UTIL	FY 93 FUNDED WKLD	FY 93 @1615 CAP	FY 93 CAPACITY % UTIL	FY 94 FUNDED WKLD	FY 94 @1615 CAP	FY 94 CAPACITY % UTIL	FY 95 FUNDED WKLD	FY 95 @1615 CAP	FY 95 CAPACITY % UTIL
SAAD	975	2,394	40.73%	1,113	2,394	46.49%	914	2,394	38.18%	914	2,394	38.18%	914	2,394	38.18%
TOAD	1,907	3,859	49.42%	2,122	3,859	54.99%	2,144	4,570	46.91%	2,144	4,570	46.91%	2,144	4,570	46.91%
SM-ALC	1,194	1,777	67.19%	1,265	1,777	71.19%									
USMC BAR	206	203	101.67%	170	164	103.38%	169	166	101.57%	170	166	102.17%	181	172	105.07%
USMC ALB	220	213	103.10%	247	238	103.85%	250	238	105.11%	251	240	104.67%	253	240	105.50%
NAD-PN	9	14	64.5%	9	14	65.7%	9	14	65.7%	9	23	38.3%	9	14	65.7%
NAD-JA	1	5	20.4%	1	5	20.4%	1	5	20.4%	1	5	20.4%	1	5	20.4%
NAD-NOR	4	19	20.2%	4	19	21.5%	4	19	21.5%	4	19	21.5%	4	19	21.5%
NESEC SD	16	25	62.9%	18	25	70.7%	19	25	74.7%	21	25	82.5%	23	25	90.4%
NESEC POR	2	4	51.1%	2	4	51.1%	2	4	51.1%	2	4	51.1%	2	4	51.1%
AF-ALC'S							1,306	1,306	100.0%	1,282	1,282	100.0%	1,272	1,272	100.0%
	4,534	8,513	53.3%	4,951	8,499	58.3%	4,818	8,741	55.1%	4,798	8,729	55.0%	4,803	8,715	55.1%

GROUND COMMUNICATIONS-ELECTRONICS STUDY

OPTION IV: SM-ALC GCE WORKLOAD TO OTHER ALCs

1. ASSUMPTIONS:

Based on current data available, the following major assumptions were made:

a. Performance, quality, and cost to repair like items are roughly equivalent at all AFLC depots.

b. Maximum capacity is defined in terms of direct manhours (1615/person/year X .95) that are calculated based on the maximum number of direct labor personnel that can effectively work in a single shift within the associated shop category.

c. With Air Force units deployed world-wide, there is no cost advantage to East coast or West coast depot locations.

d. Transfer of SM-ALC's GCE workload to another location would not result in nor necessitate closure of SM-ALC or McClellan AFB.

e. Relocation of SM-ALC's GCE depot maintenance workload to another Air Logistics Center would necessitate the relocation of the Inventory Control Point (ICP) functions also.

2. COST/SAVINGS: (SEE ATTACHED TABLE)

There is no cost advantage to moving SM-ALC's GCE workload to another ALC. Over a five year period, the net loss to the government would be $52.1 M.

3. WORKLOAD CAPACITY IMPACT:

Transferring SM-ALC workload to another ALC would have an adverse impact on DoD capacity utilization. Although a portion of the SM-ALC GCE facilities could be closed (laid away), the balance of the SM-ALC facilities would need to remain open to perform Space, Avionics, Early Warning and other electronic workloads, and would do so at a reduced capacity utilization. The net result would be a decrease in utilization from 69 percent to 45 percent (see Table X(2)). (Minus 1.194M direct labor hours of workload and minus .833M direct labor hours of laid away capacity).

4. MOBILITY/SURGE/CORE/READINESS IMPACTS:

a. SM-ALC's GCE workload has always been used as a significant contributor to the center's "Critical Mass" (that amount/type of peacetime workload needed to sustain a workforce capable of meeting wartime requirements). Since most GCE is low surge, it is used to offset the center's high surge workloads for wartime planning. Loss of the GCE would lead to a plethora of high surge workload at SM-ALC and thus a surge imbalance.

for sea shipments. Depot support response time would be adversely impacted by not having these transportation resources readily available, as would be the case in a workload transfer.

5. POTENTIAL FACILITY LAYAWAYS: Draft layaway analysis results in a computed $ 569,967 first year cost (see Table X(2)).

6. PROs AND CONs:

a. PRO:

Increased capacity utilization at other ALCs.

b. CONs

(1) Transferring SM-ALC's GCE workload to another ALC would be very costly. It would take more than 15 years for the 16 percent indirect efficiency difference to amortize the initial cost of this option.

(2) Removing GCE (approximately 1.2M manhours of direct labor) from SM-ALC would increase the overhead rate for remaining workloads.

(3) Removal of this workload from SM-ALC would degrade the skill base needed to support Space and other electronic workloads at SM-ALC.

(4) There will be some duplication of facilities and equipment between SM-ALC and other ALCs. Many facilities must remain open to support space and other electronics workloads that SM-ALC would continue to repair in the event of a GCE transfer. Many pieces of equipment must be duplicated to support ICP engineering, software and system integration functions.

(5) Capacity utilization efficiency at SM-ALC would be reduced. Little capacity would be eliminated (see Table X(2)).

(6) SM-ALC's surge capability would deteriorate due to loss of low surge peacetime workload.

(7) SM-ALC facilities are designed to support very large, low volume system repair. Many items are in depot once every several years. Most other DoD facilities are designed for production line repair of large numbers of smaller items. Transition would be very difficult for a gaining depot activity. The Automated Storage and Retrieval systems at SM-ALC are designed for OMEI-type (large GCE systems) work. With the floor space and physical weight-bearing capacity to support this effort, SM-ALC can store, track, transport, and manage all levels of GCE workload. Systems at other depots designed for smaller electronics workloads are not applicable to physically large systems, with long lead composite times, and short lead sub-system times. In-depot management of GCE systems during the OMEI (overhaul) phase is critical to timely support. This facility and experience base would be lost with transfer of GCE from SM-ALC.

MICROELECTRONICS TECHNOLOGY CENTER
13,000 square feet Class 100 clean room $35,000,000.00 capital investment 36 Electronics Applications Engineers

(b) PWB MANUFACTURE: SM-ALC's printed wire board manufacture facility can manufacture, test, and repair all types of circuit board assemblies found in industry today. Testing is possible from bare board through finished assembly, using Xray and/or ATE, depending on requirement.

PWBA MANUFACTURING AT SM-ALC (overview)	
15,000 square feet $9,797,000.00 capital investment Quality Assurance/Mil Spec Compliance Lab	
PWBA TECHNOLOGIES SUPPORTED	
Surface Mount Technology Tape Automated Bonding Circuit On Board	Fine Pitch Technology Multi Chip Module Plated Through Hole
TYPES OF PWB's MANUFACTURED AT SM-ALC	
single sided flex multilayer	double sided ceramic

(c) NON-DESTRUCTIVE INSPECTION: The Neutron Radiography Non-Destructive Inspection (NDI) facility at McClellan is the largest robotic NDI facility in the world-military or commercial. This facility can handle an entire aircraft and inspect the structure for cracks, corrosion and other defects. This facility also provides SM-ALC with the unique ability to test and certify the radiation hardness of items requiring this critical capability. A small nuclear reactor is the core of the NDI capability. This capability cannot be moved due to the possibility of contamination from the reactor. The NDI facility is a concrete and steel structure with insulated roof, concrete floors, X-ray and N-ray shielding, heating and ventilating systems, lighting, fire protection, restrooms, and offices. The N-ray and X-ray bays must have floors capable of supporting medium load, tricycle gear fighter aircraft. The X-ray cell has 12 inch concrete shielding in the ceiling. There are four radiation source pits (four feet by six feet by three feet deep)-one in each corner of the N-ray bay. There are two powered and shielded doors in N-ray. One is 25 feet by 89 feet and the other is 8 feet by 10 feet powered and shielded. There are also two main doors in X-ray, one 25 feet by 78 feet and the other 8 feet by 10

done in the same location as the repair, TPS support is readily available. With GCE systems being modified rather than replaced, TPSs need to be updated, as required. At SM-ALC the TPS engineers work with the repair technicians to accomplish TPS modifications in a timely manner. This consolidated effort results in minimal lag time for support, and a timely audit trail for documenting upgrades to the T.O. system. The success of the TPS capabilities at SM-ALC have garnered customers world-wide: Saudi Arabia and Canada have contracted with SM-ALC for TPS development on their State-of-the-Art GCE systems.

TPS DEVELOPMENT AT SM-ALC (overview)
30,000 square feet of facilities
$45,000,000.00 capital investment
41 separate ATE systems
72% of personnel have EE degrees

(g) ADVANCED COMPOSITES: The Advanced Composites Program Office (ACPO) was established at McClellan in 1983. The role of this office is to establish a capability to apply advanced composites technology and then to export this technology to other DoD activities. Work done in advanced composites at McClellan is on the leading edge of this technology. The ACPO provides training to Air Force personnel in 6 major areas: Composite Materials, Basics of Structural Design, Processing/Quality Control, Repair Techniques, Composite Tooling, and Injection Molding of Thermoplastics. The office fully supports Three-dimensional CAD/CAM/CIM, Drafting, Solids Modeling, Finite Element Analysis, Whiffle Design and Five-Axis Numerical Control Programming. The operational test facility is capable of simulating aerodynamic heating (up to 500° F while applying stress. The Thermoplastic Injection Molding Facility can manufacture items with a 500 square inch, single plane surface area and a maximum weight of 20 pounds, clamped with up to 1500 tons of pressure.

(10) The requirements for successful depot activation cross the lines of engineering, planning, logistics and technology. These skills are amassed through training, both formal and on-the-job, and experience. The depot activation team at SM-ALC is synergistic, and this would be lost when workloads are transferred. Because of the many issues that go into successful support a GCE system, SM-ALC has a support organization that specifically addresses the following issues of logistic support:

(a) SATAF: As part of the Site Activation Task Force, team members from SM-ALC work towards a successful system turnover. By having technicians on site, future support problems are noted and planned for.

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

OPTION IV - TRANSFER SM-ALC GCE WORKLOAD TO ANOTHER ALC

COST ANALYSIS - AIR FORCE INPUT

1. RELOCATION OF PRODUCTION EQUIPMENT: The plant equipment located at SM-ALC for use with GCE depot level maintenance was reviewed by SM-ALC engineers and equipment specialists. Only peculiar support equipment was identified for possible transfer. That equipment that was exclusively used for workload identified as a candidate for transfer was evaluated for shipping requirements, with the following results:

TEARDOWN/PACK/UNPACK/SETUP/CALIBRATE	$3,600,000
SHIPPING	420,000
TOTAL:	$4,020,000

2. PERSONNEL REDISTRIBUTION:

a. The cost to redistribute SM-ALC's GCE depot maintenance workforce includes the expenses delineated below. Available employment in the Sacramento area is predominantly service oriented. The vast preponderance of industrial jobs are with DoD either at SM-ALC or SAAD. Electronics firms in the area offer predominantly assembly jobs, for which displaced SM-ALC blue collar employees would be over qualified. Therefore, it would be at least 24 weeks before most of the displaced employees would find suitable employment. It is also expected that only 5% of the displaced blue collar employees would accept offers to transfer to other locations. It has been our experience that blue collar workers are reluctant to leave the area. Most families are dual-income, and would prefer to operate for 6 months to a year on a single income awaiting suitable employment in the area.

b. It is expected that 25% of the white collar workers in the ICP functions would transfer to another ALC. White collar workers with the Air Force are more mobile and more apt to accept employment elsewhere with the Air Force. There is also a greater number of local jobs for which the displaced white collar workers would qualify at similar pay. Therefore, a period of 12 weeks unemployment is expected for white collar.

c. No military relocations are expected from SM-ALC.

WAGE GRADE:

TOTAL SM-ALC GCE EMPLOYEES:	719	
NUMBER OF TRANSFERS:	36	(.05 * 719)
NUMBER SEVERED:	683	
UNEMPLOYMENT PERIOD:	24	WEEKS
AVERAGE AGE:	44	
AVERAGE YEARS SERVICE:	14	
AVERAGE SALARY:	$31,211	

GROUND COMMUNICATION AND ELECTRONICS WORKLOAD REQUIRING DEPOT-DEDICATED SYSTEMS FOR ORGANIC SUPPORT:		
GPN-20	GRC-212	FMQ-12
TPN-19	MRC-107	TSQ-111
MPS-11	MRC-108	TSC-60
FPN-62	MPQ-T3	GRC-616
MPN-14	MPS-9	GRC-206
TPS-43	MSQ-77	TPQ-43
TPS-75	MST-T1	VPQ-1
FPS-6	MODEL 40	GSQ-24
FPS-20	UGC-129	UGC-140
FPS-93	DISS ANTENNA	DUAL FREQUENCY SIGNALING UNIT
GMD-5	SCOPE SIGNAL III	DEFENSE DATA NETWORK
	TPS-77	TACTICAL DIGITAL FACSIMILE

c. COSTS:

REPLACEMENT OF HOT MOCK-UPS:	$ 0
SPECIALIZED FACILITIES/RENOVATION:	5,300,000
SPECIALIZED TEST EQUIPMENT NOT AVAILABLE FOR TRANSFER (SEE ITEM 1):	3,400,000
TOTAL:	$ 8,700,000

4. TRANSPORTATION CHANGE: Based on the world-wide deployment of Air Force GCE equipment, the volatility of global requirements, and the relative equivalence of transportation access in the Sacramento and other centerlocations, no additional costs or savings can be claimed for location.

5. INVENTORY: Electronics supplies used exclusively for SM-ALC's GCE depot level repair and overhaul would be transferred to another ALC.Supplies that are common to other workloads at SM-ALC would be retained at SM-ALC and would have to be duplicated at another ALC.

COST OF RELOCATION:	$ 400,000
COST OF DUPLICATION:	1,320,000
TOTAL:	$1,720,000

6. NEW PERSONNEL:

a. Costs associated with this element include recruitment expenses, training costs, ICS during transfer and recruitment phase at the gaining location, and productivity loss resulting from new personnel. Extensive training requirements are associated with the type of workload being transferred (specifically the OMEI workload) that currently exists only at SM-ALC. It is estimated that 50% of the new-hires at the new location would require training of this magnitude. An example of training is described below for the TPS-43 Radar:

personnel. Indirect personnel (43) multiplied by the average salary ($ 30,964) equals a $ 1,331,452 savings.

8. COST SAVINGS ON MILCON: None

9. BASE OPERATIONS SUPPORT (BOS): Zero savings. Any reduction in GCE direct labor at SM-ALC would have an additive effect on remaining direct labor operations (workloads such as aircraft, space, air warning, etc). While decreases in industrial plant utility and maintenance costs would occur, BOS operations which are costed over the entire SM-ALC maintenance complex would cause a net increase to the remaining depot operations. In addition, the SM-ALC utility and maintenance cost decreases would also result in corresponding increases at other ALCs.

SM-ALC LAYAWAY SPREADSHEET

DRAFT

BUILDING	WORK POSITIONS	PEACETIME CAPACITY	AREA (SQ FT)	COST OF OWNERSHIP	COST TO LAYAWAY	COST TO MAINTAIN LAYAWAY	COST (+) SAVINGS (-)	LAST USE
637	608	830,490	128,000	98,047	490,005	92,250	+ 484,208	GC&E REPAIR AND OVER-HAUL
1093	159	202,431	35,885	56,977	142,822	26,914	+ 112,759	
TOTAL	767	833,121	158,885	155,024	632,827	119,164	+ 596,967	(1ST YR)

FY91 (ANALYSIS YEAR) OPTION IV IMPACT

5 YR RESULT - + 453,527 (COST)

17.6 YR PAYBACK

ELIMINATE SM-ALC GC&E WORK POSITIONS

COST SAVINGS FOR YEAR TWO AND OUT - 155,024 - 119,164 - 35,860 PER YEAR

UTILIZATION:

MINUS 1.194 HOURS UTILIZATION
MINUS .833M HOURS CAPACITY
DECREASES REMAINING C-E UTILIZATION TO 45 PERCENT

NOTE: THIS REPRESENTS A ROUGH ORDER OF MAGNITUDE ESTIMATE. DURATION OF THE DDMC SUB-GROUP FOR GC&E STUDY DID NOT PERMIT IN-DEPTH STUDY NEEDED TO PRODUCE ACCURATE DATA. OTHER C-E FACILITIES ARE JOINT USE AND DO NOT APPLY.

TABLE X(2)

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

Option V: Competition - Private/Public, Public/Public.

1. This option addresses potential savings to be accrued through full and open competition of non-core GCE workloads. This option will be executed by the Services Maintenance Corporate business offices and coordinated by the Joint Depot Maintenance Analysis Group (JDMAG) with oversight provided by the Joint Policy Coordinating Group on depot maintenance. The full exploitation of opportunities for savings identified by this option is an evolutionary process involving ongoing and future programs that include but are not limited to:

a. Existing commercial contracts

b. Existing non-core organic workloads

c. Existing Depot Maintenance Interservice Support Agreements (DMISAs)

d. New starts currently in the depot maintenance source of repair decision logic process

e. Planned major refurbishment, modification, product improvement (PIP), service life extension (SLEP), etc., programs

f. Existing and planned manufacturing and fabrication programs.

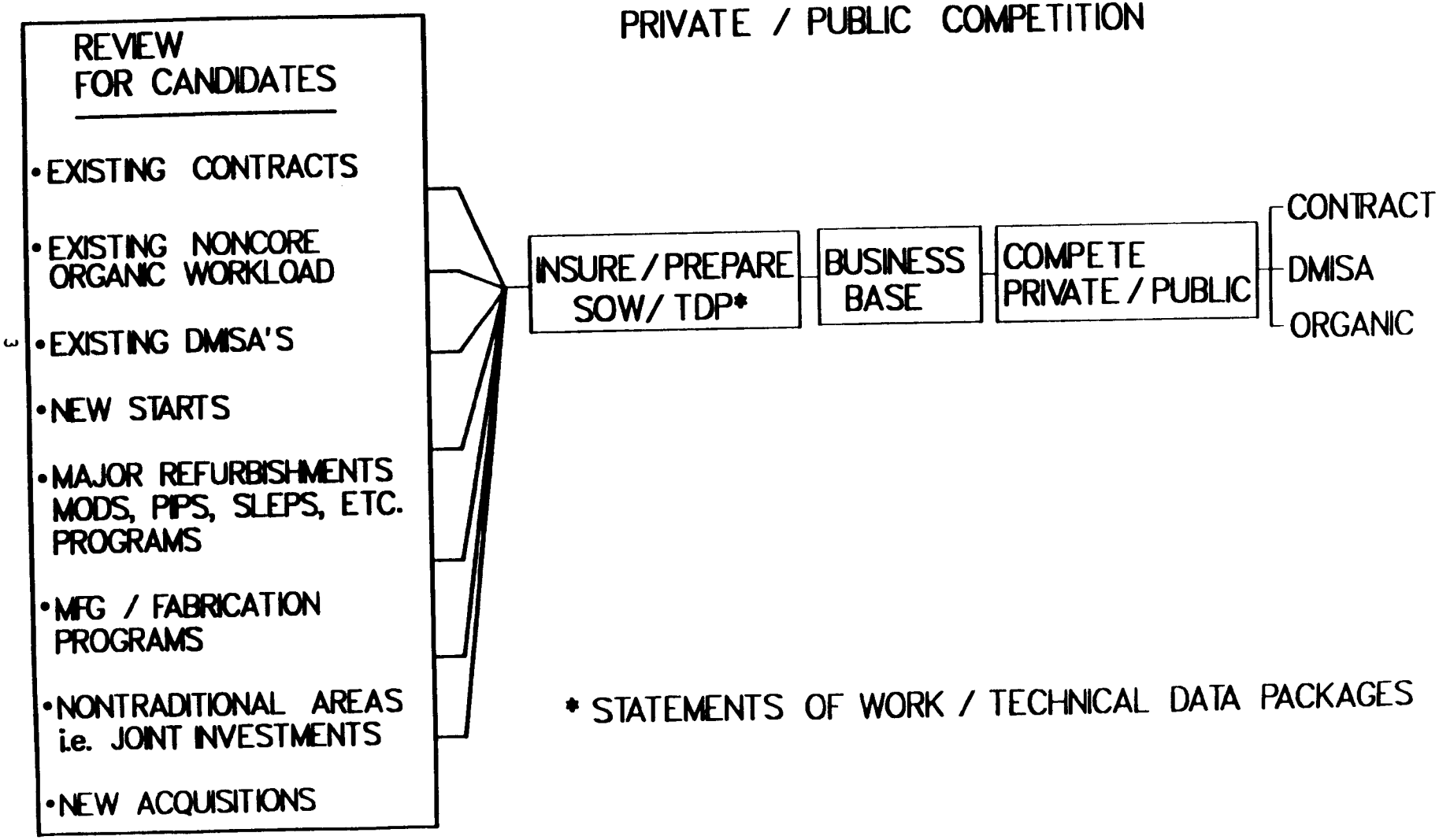
g. Non-traditional areas for joint investment opportunities

h. New acquisitions

2. If the Navy's competition experience is applicable, a cost savings or avoidance (depending whether the candidate is from an ongoing or future program) in the order of magnitude of 15 to 20 percent may be realized. This study provides the nucleus of the business base. As each Statement of Work (SOW) and Technical Data Package (TDP) is provided, the candidate will be entered into the business base and competed as indicated in Figure 1.

3. Reference (m), the Joint Service Memorandum for the Assistant Secretary of Defense concerning strengthening depot maintenance, identified savings targets to accomplish the $2.2 billion savings specified in the long range plan for increased efficiencies in depot maintenance. Tables 1 through 4, attached, provide the results of an analysis by the GCE team to allocate a proportionate share of the inter-service and competition savings targets to the GCE commodity. The service targets have been

GROUND COMMUNICATIONS ELECTRONICS BUSINESS BASE FOR PRIVATE / PUBLIC COMPETITION



* STATEMENTS OF WORK / TECHNICAL DATA PACKAGES

FIGURE 1

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

FY-93 COMPETITION SAVINGS ANALYSIS

TABLE 2

	INTER-SERVICING (PUBLIC/PUBLIC) $(000)				PRIVATE SECTOR COMPETITION $(000)			
SERVICE	WORKLOAD TO BE COMPETED	PROJECTED GROSS SAVINGS	COST OF COMPETITION	PROJECTED NET SAVINGS	WORKLOAD TO BE COMPETED	PROJECTED GROSS SAVINGS	COST OF COMPETITION	PROJECTED NET SAVINGS
ARMY	$12,411.1	$1,489.3	$372.3	$1,117.0	$35,281.3	$7,056.3	$1,411.3	$5,645.0
NAVY	$37.8	$4.5	$1.1	$3.4	$370.0	$74.0	$14.8	$59.2
AIR FORCE	$3,111.1	$373.3	$93.3	$280.0	$14,987.5	$2,997.5	$599.5	$2,398.0
MARINE CORPS	$1,066.7	$128.0	$32.0	$96.0	$3,400.0	$680.0	$136.0	$544.0
TOTAL ALL SERVICES	$16,626.7	$1,995.2	$498.8	$1,496.4	$54,038.8	$10,807.8	$2,161.6	$8,646.2

ALL VALUES INCLUDE FY-92 COMPETITION STILL IN FORCE

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

FY-95 COMPETITION SAVINGS ANALYSIS

TABLE 4

	INTER-SERVICING (PUBLIC/PUBLIC) $(000)				PRIVATE SECTOR COMPETITION $(000)			
SERVICE	WORKLOAD TO BE COMPETED	PROJECTED GROSS SAVINGS	COST OF COMPETITION	PROJECTED NET SAVINGS	WORKLOAD TO BE COMPETED	PROJECTED GROSS SAVINGS	COST OF COMPETITION	PROJECTED NET SAVINGS
ARMY	$24,822.2	$2,978.7	$744.7	$2,234.0	$105,656.3	$21,131.3	$4,226.3	$16,905.0
NAVY	$75.6	$9.1	$2.3	$6.8	$550.0	$110.0	$22.0	$88.0
AIR FORCE	$6,255.6	$750.7	$187.7	$563.0	$39,956.3	$7,991.3	$1,598.3	$6,393.0
MARINE CORPS	$2,133.3	$256.0	$64.0	$192.0	$10,800.0	$2,160.0	$432.0	$1,728.0
TOTAL ALL SERVICES	$33,286.7	$3,994.4	$998.6	$2,995.8	$156,962.5	$31,392.5	$6,278.5	$25,114.0

ALL VALUES INCLUDE FY-92, FY-93 AND FY-94 COMPETITION STILL IN FORCE

GROUND COMMUNICATIONS AND ELECTRONICS STUDY

PRODUCTION COST ANALYSIS WORKSHEET

FY-97 TO FY-95

OPTION 1 PRODUCTION COST ANALYSIS WITH/WITHOUT MATERIAL

WITH MATERIAL	HOURS	FROM	TO	RATE CHANGE	EFFECT	ONE YEAR COST/(SAVE)	3 YEAR COST/(SAVE)
SAAD TO ANAD	100,648	$60.98	$69.65	$8.67	COST	$872,618	$2,617,854
SAAD TO TOAD	813,352	$60.98	$40.11	($20.87)	(SAVE)	($16,974,656)	($50,923,969)
NET COST/(SAVE)						($16,102,038)	($48,306,114)

WITHOUT MATERIAL							
SAAD TO ANAD	100,648	$54.27	$43.68	($10.59)	(SAVE)	($1,065,862)	($3,197,587)
SAAD TO TOAD	813,352	$54.27	$34.60	($19.67)	(SAVE)	($15,998,634)	($47,995,902)
NET COST/(SAVE)						($17,064,496)	($51,193,488)

OPTION 2 PRODUCTION COST ANALYSIS WITH/WITHOUT MATERIAL

WITH MATERIAL	HOURS	FROM	TO	RATE CHANGE	EFFECT	COST/(SAVE)	
SAAD TO SM-ALC	914,000	$60.98	$55.93	($5.05)	(SAVE)	($4,615,700)	($13,847,100)
NET COST/(SAVE)						($4,615,700)	($13,847,100)

WITHOUT MATERIAL							
SAAD TO SM-ALC	914,000	$54.27	$45.55	($8.72)	(SAVE)	($7,970,080)	($23,910,240)
NET COST/(SAVE)						($7,970,080)	($23,910,240)

OPTION 3 PRODUCTION COST ANALYSIS WITH/WITHOUT MATERIAL

WITH MATERIAL	HOURS	FROM	TO	RATE CHANGE	EFFECT	COST/(SAVE)	
SAAD TO TOAD	813,352	$60.98	$40.11	($20.87)	(SAVE)	($16,974,656)	($50,923,969)
SM-ALC TO TOAD	1,306,000	$55.93	$40.11	($15.82)	(SAVE)	($20,660,920)	($61,982,760)
SAAD TO ANAD	100,648	$60.98	$69.65	$8.67	COST	$873,062	$2,619,185
NET COST/(SAVE)						($36,762,514)	($110,287,543)

WITHOUT MATERIAL							
SAAD TO TOAD	813,352	$54.27	$34.60	($19.67)	(SAVE)	($15,998,634)	($47,995,902)
SM-ALC TO TOAD	1,306,000	$45.55	$34.60	($10.95)	(SAVE)	($14,300,700)	($42,902,100)
SAAD TO ANAD	100,648	$54.27	$43.68	($10.59)	(SAVE)	($1,065,862)	($3,197,587)
NET COST/(SAVE)						($31,365,196)	($94,095,588)

DoD TACTICAL MISSILE STUDY

PREPARED FOR:

DEFENSE DEPOT MAINTENANCE COUNCIL

ANAD
with Cop Equip Disc

18 JANUARY 1991

To document [illegible]
Depot maintenance [illegible]
[illegible]

TACTICAL MISSILE STUDY

EXECUTIVE SUMMARY

The tactical missile study was performed in response to Deputy Secretary of Defense memorandum of June 30, 1990 titled "Strengthening Depot Maintenance Activities". NAVAIR was assigned lead service responsibility for this study by the Defense Depot Maintenance Council (DDMC). The initial meeting was called by the lead service on 30 August 1990 with all Services represented. It was decided tactical missile categories to be analyzed were surface launched (fired from Navy ships), ground launched (fired from the ground - Army and Marine Corps), air launched (fired from aircraft - Navy, Army, Air Force, and Marine Corps), and missile support equipment (Army and Marine Corps. ALCM, ACM, SRAM, Tomahawk, ICBM, and Sub-launched Ballistic Missiles were considered to be outside the scope of tactical missiles. Emerging programs will be accommodated by each Service as they are released for Service use.

The study baseline was the FY 91 President's Budget. The study encompassed the organic and private sector efforts for depot and intermediate (I-level)) maintenance. Recommendations were made in both areas. Careful consideration was given to the operational requirements of each Service. No recommendation of the study group perturbates the effectiveness of each Service to perform its assigned mission.

The four alternatives considered ranged from status quo to a consolidation of all depot efforts (except MCLB Barstow) at one location plus I-level consolidations for Navy activities. The underlying assumption throughout the study was all private sector and organic efforts could be competed, without regard to whether or not the depot was organic or the private sector. Alternatives two and three were considered as permutations and/or combinations of possibilities to evaluate the feasibility of less than optimization of consolidation and are not to be considered as all encompassing of the myriad of possibilities that can be considered. Some savings are possible with the consolidation of any workload, however, full consolidation at one site has the greatest potential for savings and increased effectiveness.

The site selected that provided the needed infrastructure is Letterkenny Army Depot (LEAD) - Alternative four. LEAD is the only existing site that can perform the consolidation of all existing Services' depot workload.

The savings associated with alternative four is 35 % of the current cost of missile workload to be consolidated. 50 % of the cost of existing workload is associated with actual hands-on effort (this direct effort is necessary wherever the workload is located). 15 % of the cost is expended by overhead in support of the hands-on effort (this effort is necessary to be transferred

along with the direct hands-on effort). 35% of the cost is related to the physical facilities cost where the workload is located (this cost would not transfer). The underutilized facilities at LEAD can accommodate the influx of all Services' depot workload without new construction.

Although LEAD is the site of choice and can accommodate all Services' workload, major changes are absolutely required in the way workload and funding is planned and monitored for LEAD. Presently the workload planning and funding go through DESCOM. This results in delays and frustrates the work effort. Each Service must be allowed to deal with LEAD directly on their workload and funding. Technical requirements will be determined by each Service and any alteration to design parameters will require the express consent of the owning Service and is not open for negotiation. While the depot must comply totally with the design specifications of the owning Service the depot will have total freedom to design the infrastructure and test methodologies to accomplish the end result.

In addition to the analysis of depot maintenance for interservicing, consolidation, and competition, the study also recommends that certain technology monitoring and process improvement assignments be made to a single site within DoD. Also, depot activities must be totally complemented facilities that will allow for the failed article to be restored to original design parameters without having to rely on outside sources for some of the related industrial processes. These recommendations are further amplified within the text of this study.

The depot effort must be transparent to the owning Service, and any decision that results in cost reductions, firm schedules, and continued quality should be embraced. The performance of depot maintenance by the private sector is prima facie evidence that service parochialism must not be allowed to preclude consolidation of workload within another Service.

It is the firm opinion of the study team the depot maintenance effort is in need of overhaul. Additionally, the management philosophies that resulted in an inefficient operational mode must be changed. While 35% savings are realistic for the tactical missiles depot, a greater potential exists for improvement in the way that each Service manages and duplicates oversight of the depot operations.

18 January 1991

Richard E. Eldridge
Navy

Gary L. Baker
Marine Corps

Tommie Cutts Jr.
Army

Samuel K. Kelley, LTC
Air Force

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A. Weapon System Matrices

B. Example of a Technology Center Assignment (PHS&T)

1. STUDY METHODOLOGY

a. Scope. The Tactical Missile Study is an analysis of Army, Navy, Air Force, and Marine Corps tactical missiles and associated Army/Marine Corps missile support equipment (launchers, radars, fire control,etc.). The results of this study provide recommendations concerning consolidation, competition, and interservicing for enhanced, efficient, and cost effective depot operations. [redacted]).

b. Assumptions/Definitions

[redacted]

[redacted] There shall be no degradation of [redacted] operational or mission capabilities. [redacted] operational support will [redacted]

(2) CONUS organic and private sector depots and industrially funded intermediate maintenance were to be studied. OCONUS sites were to be excluded.

(3) All strategic systems and compartmentalized programs were to be excluded.

(4) Core will be accommodated and competition will be enhanced.

(5) DoD maintenance funding profiles will be relatively flat in the out years.

[redacted] Funding will be provided for consolidation recommendations, i.e., facility improvements/ modernization and relocation of required equipment.

(7) Direct to indirect ratio will increase at the gaining activity.

[redacted] Direct labor hours will not be reduced during the FY 91-95 timeframe.

(9) Number of personnel will be allowed to fluctuate as a function of workload.

[redacted] Personnel moving expenses and termination costs associated with workload consolidations were not considered.

[redacted] Skilled personnel will be available, however, peculiar system training will be required.

[redacted] Facilities will be available at the site selected without major construction.

Definitions

(13) Depot Level Maintenance. The most in-depth maintenance actions on missile and ground support end items, assemblies, and sub-assemblies.

(14) Intermediate Level Maintenance. Testing of all-up-rounds that are either unserviceable, expired serviceable time, or fleet returned captive flown missiles; isolating failures to major missile assembly; removes and replaces failed assemblies; and returns serviceable missiles to inventory.

c. Analysis Factors/Criteria. Analysis of tactical missile DoD depots and intermediate level facilities was based on workload, costs, capabilities, capacity utilization, skills, community infrastructure, and environmental impacts.

d. The tactical missile team composition was comprised of the following Service representatives:

NAME	ORGANIZATION	AUTOVON
Richard Eldridge (Team Leader)	NAVAIR (Navy)	222-0992
Gary Baker	MCLB (Marine Corps)	282-7225
Tommie Cutts	MICOM (Army)	746-4222
LtCol Sam Kelley	WR-ALC (Air Force)	468-0021
A. J. Meyer	DESCOM (Army)	570-5213
Kenneth Brooks	MICOM (Army)	746-3201
David Goodman	LEAD (Army)	570-8714
Gloria LaCroix	NAVSEA (Navy)	332-1195
Henry Szarek	MICOM (Army)	788-7474

e. The sources and methods of collection included team member expertise, budget submissions, depot briefings, data calls, and the following site visits:

OO-ALC (AF)

ANAD (Army)

SAAD (Army)

SM-ALC (AF)

NAC, Indianapolis (Navy)

NWS, Charleston (Navy)

NWS, Concord (Navy)

NADEP, Alameda (Navy)

MCLB, Barstow (Marine Corps)

AGMC (AF)

LEAD (Army)

TOAD (Army)

RRAD (Army)

NWS, Seal Beach (Navy, 3 locations)

NWS, Yorktown (Navy)

NWSC, Crane (Navy)

NADEP, Norfolk (Navy)

General Dynamics, Pomona (Contractor)

McDonnell Douglas, St. Louis (Contractor)

[redacted]

[redacted]

[redacted] systems [redacted] depot and intermediate level maintenance cost savings [redacted] are at table [redacted]

c. [redacted], Appendix A, quantifies work-load by weapon system. The analysis of the workload resulted in the identification of candidates for consolidations, interservic-

TABLE 1

COMMODITIES STUDIED BY TACTICAL MISSILE STUDY GROUP

NAME	SERVICE	MISSION	TYPE	SOURCE(S) OF DEPOT REPAIR	PRIME CONTRACTOR
ATACMS	USA	FIRE SUPPORT	INERTIAL GUIDANCE	LTV TRANSITIONING TO ANNISTON AD	LTV
AVENGER (PEDESTAL MOUNTED STINGER)	USA	SURFACE-TO-AIR	IR HOMING	GD TRANSITIONING TO ANAD	GENERAL DYNAMICS
CHAPARRAL	USA	SURFACE-TO-AIR	IR HOMING	RED RIVER AD	FORD AEROSPACE
DRAGON	USA(L) USMC	ANTI TANK	WIRE GUIDED	ANNISTON AD	McDONNELL DOUGLAS
HARM	USN(L) USAF	AIR-TO-SURFACE	ANTI RADIATION	TEXAS INSTRUMENTS TRANSITIONING TO NADEP ALAMEDA	TEXAS INSTRUMENTS
HARPOON	USN(L) USAF	AIR-TO-SURFACE	RADAR GUIDED	McDONNELL DOUGLAS TRANSITIONING TO NADEP ALAMEDA	McDONNELL DOUGLAS
HAWK	USA(L) USMC	SURFACE-TO-AIR	RADAR GUIDED	LETTERKENNY AD MCLB BARSTOW RED RIVER AD RAYTHEON	RAYTHEON
HELLFIRE	USA(L) USMC	ANTI TANK	LASER GUIDED	ROCKWELL MARTIN MARIETTA	ROCKWELL MARTIN MARIETTA
LANCE	USA	SURFACE-TO-SURFACE	INERTIAL GUIDANCE	ANNISTON AD	LTV
LCSS	USA	LAND COMBAT TEST EQUIPMENT	AUTOMATIC TEST EQUIPMENT	ANNISTON AD	RCA

TABLE 1

COMMODITIES STUDIED BY TACTICAL MISSILE STUDY GROUP

NAME	SERVICE	MISSION	TYPE	SOURCE(S) OF DEPOT REPAIR	PRIME CONTRACTOR
MAVERICK	USAF(L) USN	AIR-TO-SURFACE	TV/IR/LASER GUIDED	OGDEN-ALC HUGHES	HUGHES RAYTHEON
MLRS	USA	FIRE SUPPORT	FIRE CONTROL EQUIPMENT	RED RIVER AD BENDIX NORDEN	LTV
NIGHT SIGHTS	USA(L) USMC USAF USN	NIGHT VISION	INFRARED	SACRAMENTO AD BARSTOW MCLB	KOLLSMAN TEXAS INSTR
PATRIOT	USA	SURFACE-TO-AIR	RADAR GUIDED	LETTERKENNY AD RED RIVER AD RAYTHEON	RAYTHEON
PHOENIX	USN	AIR-TO-AIR	ACTIVE RADAR HOMING	NADEP ALAMEDA	HUGHES
REDEYE	USA	SURFACE-TO-AIR	IR HOMING	NO REPAIR	GENERAL DYNAMICS
SHILLELAGH	USA	SURFACE-TO-SURFACE	IR BEAM GUIDED	NO REPAIR	PHILCO FORD
SHRIKE	USN(L) USAF	AIR-TO-SURFACE	ANTI RADIATION	NADEP ALAMEDA	MOTOROLA
SIDEARM	USN(L) USMC	AIR-TO-SURFACE	ANTI RADIATION	MOTOROLA	MOTOROLA
SIDEWINDER	USN(L) USAF	AIR-TO-AIR	IR HOMING	OGDEN-ALC CRANE NAC NORFOLK	FORD AEROSPACE

TABLE 1

COMMODITIES STUDIED BY TACTICAL MISSILE STUDY GROUP

NAME	SERVICE	MISSION	TYPE	SOURCE(S) OF DEPOT REPAIR	PRIME CONTRACTOR
SKIPPER	USN	AIR-TO-SURFACE	SEMI-ACTIVE LASER	NO REPAIR	EMERSON ELECTRIC
SPARROW	USN(L) USAF	AIR-TO-AIR	SEMI-ACTIVE RADAR HOMING	NADEP ALAMEDA	RAYTHEON
STANDARD MISSILE SM I, II	USN	SURFACE-TO-AIR	ANTI RADIATION	GD RAYTHEON NWS SEAL BEACH MOTOROLA	RAYTHEON GENERAL DYNAMICS MOTOROLA
STINGER	USA(L) USAF USMC	SURFACE-TO-AIR	IR HOMING	NO REPAIR	GENERAL DYNAMICS
TOW (TOW/TOW2/BFVS)	USA(L) USMC	ANTI TANK	WIRE GUIDED	ANNISTON AD HUGHES	HUGHES
WALLEYE	USN(L) USAF	AIR-TO-SURFACE	TV DATA LINK IR HOMING	MARTIN MARIETTA NAC INDIANAPOLIS	MARTIN MARIETTA

ing, and public/private competition to achieve depot and intermediate level maintenance cost savings pursuant to the DEPSECDEF memorandum, 30 June 90,"Strengthening Depot Maintenance Activities".

d. [redacted] Each site visited provided information relative to the listed factors. [redacted] An in-depth analysis of tactical missile depot and intermediate level maintenance facilities included the following:

(a) Buildings - utilization/availability/proposed construction.

(b) Accessibility - proximity to rail/port/air/road systems.

(c) Power - requirements/stability/availability.

(d) Security - fencing, lighting, fire protection, personnel.

(e) Industrial support - availability of internal/external support to meet surge requirements.

(f) Storage - piece parts, subassemblies, and inert/explosive capacities.

(g) Geographical Consideration - seismic zones and weather patterns.

(h) Environmental - compliance/noncompliance issues.

[redacted] An analysis of support equipment required to accomplish depot and intermediate level maintenance for tactical missiles at each site visited concentrated on the availability of: 1) Standardized automatic test equipment (ATE) and test stations that could accommodate unique test program sets (TPS) software programs; 2) Class 100 - 100,000 particle count clean rooms; 3) Equipment modernization programs that enable maintenance test repair requirements to be accomplished on the latest technology of single level/multiple level circuit card assemblies; 4) Material Handling Equipment that supports repair action/processes with ease and efficiency.

[redacted] A multi-faceted highly skilled

labor force is required in support of the tactical missile depot and intermediate level maintenance facilities. The direct labor production skills are electronic integrated system mechanics, electronic mechanics, electronic measurements equipment mechanics, electrical equipment repairers, ordnance equipment mechanics, electronic computer equipment mechanics, air conditioning mechanics, instrument mechanics, electro/optical repairers, electronic integrated systems inspectors, munitions/explosive operators, and various production support personnel. In order to provide the organic capability to maintain, test and repair tactical missile components, skilled parts expediters, program planners and product assurance specialists are needed to enhance the maintenance function.

[redacted] An experienced team of planner, engineers, equipment specialists, parts expediters, and product assurance specialists are required to complement the direct labor force.

[redacted] Environmental management programs must be in place to ensure that all mission and related activities can be accomplished while still maintaining compliance with federal, state, and local environmental regulations, laws, and directives. The following environmental factors were reviewed for adverse impact: air emissions, waste water discharge concentrations, and land fill capacity to accommodate solid waste.

[redacted]

(1) Four alternatives were identified. The alternatives included consolidation, interservicing, and public/private competition. The alternatives are:

[redacted]

(b) Alternative 2 is representative of one of the possibilities that could be incorporated for either competition, interservicing, or consolidation, and demonstrates the possibility of combining similar products at a site within existing workload capabilities and capacity. As shown, NADEP Norfolk or OO-ALC could accomplish air and surface missiles as well as Chaparral. Chaparral is very similar to Sidewinder which is presently performed at NADEP Norfolk and OO-ALC. RRAD currently performs I-level ground missile maintenance and first level depot maintenance and could readily accommodate the depot efforts presently done by the private sector with little change to capability and capacity. LEAD would continue its present missile system support with Marine Corps and Chaparral depot missile systems added. The change in I-level maintenance would require the movement of Sidewinder effort from NWS Yorktown and Seal Beach to RRAD. Yorktown would continue to perform I-level maintenance for air and standard missiles with the exception of Sidewinder. Either NWS Seal Beach or Concord would perform I-level for air and standard missiles. [redacted]

[redacted] existing facilities could accommodate workload without construction.

Depot Level		Intermediate Level
NADEP Norfolk or OO-ALC	Air, Surface and Chaparral	RRAD - Sidewinder, HAWK, Patriot, Chaparral
RRAD-	Ground	Yorktown - Air and surface
LEAD - (No existing capacity elsewhere)	All missile systems	Seal Beach - Air and Surface or Concord

(c) [redacted] is presented as a potential to compete, interservice, or consolidate along technology requirements. While this alternative would result in cost efficiency gains, it would be more difficult to manage and control and would be a sub-optimum yield. If a single site won [redacted] competition, other than LEAD, additional construction would be required. Potential competing organic depots are LEAD, NADEPs Norfolk and Alameda and OO ALC. Alignment as follows:

Active -	Patriot, Hawk, Standard, Harpoon Phoenix and Sparrow
Passive -	Sidewinder, Harm, Maverick IR, Shrike and Chaparral
Terminally Guided -	Walleye, SLAM, Maverick Laser, Tow
Inertial Only -	Lance
Missile Support - Equipment	No change

(d) [redacted] 4 - LEAD can satisfy all requirements [redacted] the single depot maintenance activity. Marine Corps workload will remain at MCLB Barstow. Hawk and Patriot Theater Readiness Monitoring Facility (TRMF) maintenance will remain at RRAD. MCLB Barstow and RRAD are fully utilized, centrally located, there is no economic advantage to move, and they best satisfy each Services' mission and readiness. West coast I-level maintenance for air and standard missiles will be combined at NWS Seal Beach. NWS Charleston will be the single east coast site for standard missile with the combining of standard missile workload presently performed at NWS Yorktown. NWS Charleston was chosen as the single site for standard missiles because a new facility for missile maintenance will be completed in mid 1991. This facility can accommodate all east coast standard missile workload and will allow the cancellation of the MILCON at NWS Yorktown. NWS Yorktown will retain the east coast site for air missiles.

Depot Level	Intermediate Level
Move all to LEAD except Marine Corps work at MCLB Barstow	RRAD - TRMF (HAWK and Patriot) Charleston - Surface Yorktown - Air Seal Beach - Air, Surface

[redacted]

	FY91	FY92	FY93	FY94	FY95	Total
			($ Million)			
Army	0	1.50	7.67	21.49	40.60	71.26
Air Force	0	.20	1.90	5.70	8.20	16.00
Navy	0	.52	4.05	11.65	16.27	32.49
Marines	0	0	0	0	.51	.51
[redacted]	0	2.22	13.62	38.84	65.58	[redacted]

[redacted] NOT included as [redacted] and costs to move equipment are as follows:

(a) Alternative 1 - none

(b) Alternative 2 - $0 - 30M depending on the activity that wins the competition

(c) Alternative 3 - $0 - 30M depending on the activity that wins the competition

[redacted] 120.26
30.00
90.26

[redacted] Net cost savings are as follows:

[redacted] 64M MILCON [redacted]

(b) Alternative 3 - $37.32 to $67.32M

(c) Alternative 2 - $1.83 to $31.83M

(d) Alternative 1 - None

153.9
22.8
131.7

TABLE 2

[redacted]

PROJECT	ACTIVITY	$ MIL	FACILITY
P-271	CO	2.44	Missile Integr. Fac.
P-282	CO	5.80	AMRAAM IMA Fac.
P-289	CO	1.25	Std Msl Test Cell
P-310	CO	7.60	AIWS Maint/Test fac.
P-31515	ANAD	5.50	ATACMS
P-32320	ANAD	1.75	Inertial Guide
P-98	TOAD	* 8.20	Shelter
P-99	TOAD	*14.00	Industrial Processes
P-417	YK	11.10	VLS SM2 Encan/Decan Fac.
P-506	YK	6.00	AIWS Maint/Test Fac.
	Total	[redacted]	

$24.30M

$22.2M - associated w/ systems other than missiles

*May be included in COM-EL Study

3. [redacted]. Each service has developed policies for standard suites of ATE for the development of TPS and subsequent diagnostic and repair of electronic assemblies/subassemblies. Service unique ATE are: AF -MATE; Navy -CASS; Army -Equate/IFTE; and Marine Corps -MCATES. This individual service approach to diagnostic test and repair limits the sharing of TPS and associated repair capability. For example, an analysis of the Army and Marine Corps diagnostic test and repair of HAWK missile system performed by LEAD and MCLB, Barstow confirmed the development of service unique TPS's for common electronics assemblies/subassemblies. This action has resulted in the escalation of support costs. ATE/TPS development for depot maintenance operations costs in the 10 - 60 million dollar range for each weapon system. [redacted] A common DoD approach to diagnostic test and repair of electronic assemblies/subassemblies will result in substantial savings of developmental costs for TPSs. The selection of a standard diagnostic test and repair capability must address total service requirements,endorse the principles of true "rack and stack" test methodology, and remain flexible to emerging technologies and unique test applications.

4. FULLY COMPLEMENTED DEPOT PHILOSOPHY. DoD depots postured for the future require fully integrated complemented facilities to provide support for emerging state-of-the-art weapon systems while retaining the capability to support first generation/older equipment. Inherent in a fully complemented depot are modern industrial support capabilities (milling, welding, painting, electro-plating, etc.), computer aided design/computer aided manufacture (CAD/CAM), circuit card assembly (CCA) diagnostic test and repair, test program development,and the acceptance of a philosophy of sub-system integration into a fully operational end item to insure system integrity. Micro electronics repair processes also require integration into the depot consistent with depot source of repair assignments. The fully complemented depot philosophy is not at odds with the principle of restricting dual siting within the organic sector. The necessity to provide effective and efficient depots of the future drives the demand for fully complemented facilities.

5. ENGINEERING PRINCIPLES AND TECHNOLOGIES. Analysis of the maintenance procedures at depots and I-level locations reveals a wide variety of business practices borne out of the way engineering principles are applied. The variations in application of engineering practices result in a base of depot and I-level operation that is difficult to standardize, consolidate, compete or interservice. This further creates an unhealthy and expensive competition which derives from parochial interests of the individual Service. Most activities complete repair and manufacture requirements in compliance with locally developed engineering methodologies/processes, and have no knowledge of, or share very little of, the state-of-the-art and productivity enhancements instituted at other activities. Of particular concern are the differences in processes for energetic material (warheads, rocket motors, etc.); gyros; shelters; weapon and combat systems packaging, handling, storage, and transportability functions; microwave tubes; micro electronics; circuit card manufacture; and image intensifier tube (night vision) workload. As previously stated fully complemented facilities are essential for total end item integrity, and the sharing of innovative and enhanced engineering principles, and repair/fabrication/manufacture processes are equally vital for a successful organic structure to support DoD demands at the least cost. To provide a unified competitive baseline the organic sector must embrace the productivity enhancements and state-of-the-art breakthroughs of the private sector and also benefit from the innovative processes developed by individual organic depot activities. The best approach for ensuring the integration of private sector technology advances into the organic sector and the sharing of innovations between the organic sectors is the assignment of particular technologies to a single manager. This single manager will insure all other activities engaged in similar repair/fabrication/manufacture benefit from and share the optimum approach to workload execution. In addition, the lead activity would operate as an extension of the DDMC and would serve all Services for their particular commodity as technical experts. As such, they would provide technical advice to organic sites; support all Service acquisi-

tion managers for disciplines, commodities, and functions assigned; monitor emerging technologies; and recommend process improvements to depots and manufacturers. An example assignment is at Appendix B.

[redacted]

a. Conclusions

(1) Consolidation of depot and intermediate level maintenance results in savings for FY92 - 95 as shown in paragraph 2e(2).

(2) Single managers technology assignments enhance and provide for efficient and cost effective execution of maintenance.

(3) Future depots supporting sophisticated weapon systems demand fully complemented facilities capable of performing the full range of industrial processes.

(4) Army HAWK and Patriot missile support equipment workload is fully entrenched at LEAD and is not relocatable without major perturbations to the DoD organic infrastructure and Army operational mission assignments.

[redacted]

[redacted] tical missile depot level maintenance at [redacted] with the exception of MCLB Barstow workload for HAWK support equipment and NOS Indian Head energetic material workload. All services will coordinate directly with LEAD for workload and funding matters.

(2) Consolidate Navy tactical missile intermediate maintenance at NWS, Seal Beach (surface and air - west coast), NWS, Yorktown (air - east coast), and NWS Charleston (surface - east coast). The Army HAWK and Patriot I-level (TRMF) will remain at RRAD.

(3) Assign single management technology responsibilities in accordance with the following:

a. ATE/test/repair methodology - Naval Air Systems Command (NAVAIR).

b. Energetic material - Naval Ordnance Station, Indian Head, MD.

c. Gyros - Aerospace Guidance and Metrology Center, Newark, OH.

d. Weapon and Combat Systems PHS&T - Naval Weapons Station - Earle, NJ. (Appendix B).

e. Shelters - Tobyhanna Army Depot, TOAD, PA.

f. Circuit card manufacturer -Naval Avionics Center - Indianapolis, IN.

g. Micro electronics - Naval Avionics Center, Indianapolis, IN.

h. Microwave tubes - Naval Weapons Support Center, Crane, IN.

i. Image Intensifier tubes (night vision) - Marine Corps Logistics Base, Barstow, CA.

[redacted]

[redacted] system (ATACMS) [redacted] maintenance and stockpile reliability program efforts [redacted] using existing facilities.

(6) Select LEAD, the consolidated depot for tactical missiles, the pilot site for the proposed Defense Business Operations Fund (DBOF) program.

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								81	82	83	84	85	TOTAL	
STANDARD	N(L)		N/A	IH	7	.5	N/A					0	0	
				SL	144	10.3	I/S			1.8	3.6	3.6	9.0	
				MOTOROLA	23	2.7	P/PC				.5	.9	1.4	18.1
				RAYTH/ GEN DY	122	14.6	P/PC				2.6	5.1	7.7	

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								81	82	83	84	85	TOTAL	
SIDEARM	N(L)		N/A	FORD	1.2	.1	P/PC					.02	.02	.02

APPENDIX A

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								81	82	83	84	85	TOTAL
I LEVEL SURFACE	N(L)		N/A	YO	77	2.3	CONS		.1	.2	.2	.2	.7
				WC	47	3.0	N/A						0
				SL	78	2.7	N/A						0
				SO	64	2.7	CONS		.1	.3	.3	.3	1.0

1.7

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								81	82	83	84	85	TOTAL
I LEVEL AIR	N(L)		N/A	YO	109	4.8	N/A					0	0
				SL	85	3.6	N/A					0	0
				SO	46	2.3	CONS				.1	.2	.3

.3

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)						
								81	82	83	84	85	TOTAL	
SPARROW	N(L)		N/A	AL	74.2	4.6	I/S			.8	1.6	1.6	4.0	
				IH	3.4	.2	N/A					0	0	
	F		N/A	AL	47.3	2.9	I/S			.5	1.0	1.0	2.5	6.5

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)						
								81	82	83	84	85	TOTAL	
SIDEWINDER	N(L)		N/A	NF	14.6	2.3	I/S				.4	.8	1.2	
				IH	3.4	.2	N/A				0	0	0	
	F		N/A	FH	92.5	9.5	I/S				1.7	3.3	5.0	7.1
				NA	5.5	.4	N/A				0	0	0	
				CR	12.7	1.7	I/S				.3	.6	.9	

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								85	86	87	88	89	TOTAL
MAVERICK	F(L)		N/A	FH	88.5	6.4	I/S			1.1	2.2	2.2	5.5

5.5

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								85	86	87	88	89	TOTAL
SHRIKE	N(L)		N/A	AL	.8	.05	I/S			.02	.02	.02	.06
	F		N/A	AL	14.2	.9	I/S		.2	.3	.3	.3	1.1

1.16

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)						
								81	82	83	84	85	TOTAL	
WALLEYE	N(L)		N/A	MM	15.4	1.6	P/PC			.3	.6	.6	1.5	1.5

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)						
								81	82	83	84	85	TOTAL	
HARPOON	N(L)		N/A	MDAC	50.6	6.4	P/PC				1.1	2.2	3.3	3.9
	F		N/A	MDAC	7.9	1.0	P/PC				.2	.4	.6	

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M) 01	02	03	04	05	TOTAL
HARM	N(L)		N/A	T.I.	2.9	.4	P/PC					.1	.1
	F		N/A	T.I.	16.2	2.0	P/PC					.4	.4

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M) 01	02	03	04	05	TOTAL
SKIPPER	N(L)		N/A	AL	1.5	.09	I/S		.02	.03	.03	.03	.11

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS,I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								81	82	83	84	85	TOTAL
PHOENIX	N(L)		N/A	AL	26.3	1.6	I/S		.3	.6	.6	.6	2.1

2.1

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS,I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								81	82	83	84	85	TOTAL
MISSILE													
HAWK	A(L)		1,169	RE	49,604	2.35	N/A						
	M		847	RE	24,647	1.17	N/A						

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS,I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								81	82	83	84	85	TOTAL
MISSILE													
HAWK	M		**		32,222	2.9(M)	P/PC					.507	.507
	A		**	RAYTH	53,333	4.8(A)	(FY85)					.840	.840

1.347

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M) **	**	**	**	**	TOTAL
GRD SUP EQ													
HAWK	A(L)		**	LK	691,380	47.0	N/A						
	M		**	BB	152,804	10.4	N/A						

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M) **	**	**	**	**	TOTAL
GRD SUP EQ													
HAWK	A(L)		**	TB	59,439	2.5	CONS (FY94)				.437	.875	1.312
	A(L)		**	RAYTH	25,555	2.3	P/PC					.402	.402

1.714

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								01	02	03	04	05	TOTAL
MISSILE													
PATRIOT	A(L)		198	RE	117,969	5.6	N/A						

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A	B	C	D	E	F	G	H	I					
ITEM	SERVICE USER LEAD(L)	NON-CORE(NC) CORE(C) ABOVE CORE(AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)					
								01	02	03	04	05	TOTAL
GRD SUP EQ													
PATRIOT	A(L)		**	LK	192,703	13.1	N/A						
			**	RAYTH	311,111	28.0	P/PC (FY95)					4.9	4.9

4.9

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								**	**	**	**	**	TOTAL	
MISSILE CHAPARRAL	A(L)		287	RE	98,468	6.3	CONS (FY94)				1.10	2.20	3.30	3.3

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								**	**	**	**	**	TOTAL	
GRD SUP EQ CHAPARRAL	A(L)		**	RE	256,330	16.4	CONS (FY94)				2.87	5.74	8.61	8.61

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								93	94	95	96	97	TOTAL	
MISSILE LANCE	A(L)		128	AI	26,580	1.96	CONS (FY93)			.34	.68	.68	1.7	1.7

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								93	94	95	96	97	TOTAL	
GRD SUP EQ LANCE	A(L)		**	AI	25,768	1.9	CONS (FY93)			.332	.665	.665	1.662	1.662

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								01	02	03	04	05	TOTAL	
MISSILE TOW	A(L)		8535	AI	16,273	1.2	CONS (FY93)			.21	.42	.42	1.05	1.05

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								01	02	03	04	05	TOTAL	
GRD SUP EQ TOW	A(L)		**	AI	206,130	15.2	CONS (FY93)			2.66	5.32	5.32	13.3	13.3

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)					
								81	82	83	84	85	TOTAL
MISSILE HELLFIRE	A(L)		**	MARTIN MARIETTA	2,222	.2	P/PC (FY95)					.035	.035

.035

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)					
								81	82	83	84	85	TOTAL
MISSILE STINGER	A(L)		**	GEN DY	47,777	4.32	P/PC (FY95)					.756	.756

.756

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS,I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								**	**	**	**	**	TOTAL	
GRD SUP EQ (ATE) LCSS	A(L)		**	AI	43,396	3.2	CONS (FY93)			.56	1.12	1.12	2.8	2.8

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS,I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								**	**	**	**	**	TOTAL	
GRD SUP EQ DRAGON	A(L)		**	AI	44,751	3.3	CONS (FY93)			.57	1.15	1.15	2.87	2.87

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								91	92	93	94	95	TOTAL	
GRD SUP EQ														
MLRS	A(L)		**	BENDIX	28,888	2.6	P/PC (FY95)					.455	.455	
	A(L)		**	RE	134,417	8.6	CONS (FY92)		1.5	3.0	3.0	3.0	10.5	11.515
	A(L)		**	NORDEN	35,555	3.2	P/PC (FY95)					.56	.56	

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								91	92	93	94	95	TOTAL	
GRD SUP EQ														
APACHE-HELLFIRE FIRE CONTROL	A(L)		**	McDON DOUGLAS	128,888	11.6	P/PC (FY95)					2.03	2.03	2.03

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								01	02	03	04	05	TOTAL	
GRD SUP EQ TOW BRADLEY	A(L)		**	HUGHES	57,777	5.2	P/PC (FY94)				.91	1.82	2.73	2.73

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M)						
								01	02	03	04	05	TOTAL	
GRD SUP EQ NIGHT SIGHTS	A(L)		**	AD	197,059	12.6	CONS (FY94)				2.21	4.41	6.62	6.62

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA					
A ITEM	B SERVICE USER LEAD(L)	C NON-CORE(NC) CORE(C) ABOVE CORE(AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K)	G ANNUAL BUSINESS BASE ($M)	H CONS.I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	I PROJECTED SAVINGS ($M) **	**	**	**	**	TOTAL
GRD SUP EQ MSL SYSTEMS (ALL OTHER CONTRACTORS)	A(L)		**	ALL OTHER CONTR	102,222	9.2	P/PC (FY94)				1.61	3.22	4.83

4.83

**IT IS NOT FEASIBLE TO INDICATE UNITS DUE TO VARIOUS ITEMS AND CONFIGURATION BEING REPAIRED

Total
$100.259

PROPOSAL FOR CONSOLIDATION OF TRI-SERVICE WEAPONS AND COMBAT SYSTEMS PACKAGING, HANDLING, STORAGE, AND TRANSPORTABILITY FUNCTIONS

1. Objective: To assign technology monitoring and process improvement functions to one organization in order to avoid duplication and to more effectively accomplish Weapons Combat Systems Packaging, Handling, Storage, and Transportability (PHS&T) functions within the Department of Defense (DOD).

2. Facts:

A. The Army, Navy (including the Marines), and Air Force each is responsible for the PHS&T function within its respective service.

B. There is no fixed organization with the authority and responsibility to set policy and coordinate tri-service PHS&T efforts. The Joint Ordnance Commanders Sub-Group for Packaging Handling and Logistics (JOCSG PHL) was established to review redundant tri-service PHS&T efforts and evaluate new technologies at the working level. However, the Sub-Group meets on a semi-annual basis and members frequently change. As a result the Sub-Group is able to deal with only the highest priorities while merely touching upon others. The group does not have authority to implement a policy which could enhance efficiency through consolidation and the establishment of single service centers of excellence. Representative members can be protective of their own service interests and may be reluctant to eliminate functions or transfer functions which may be more efficiently accomplished by another service.

3. Discussion:

A. Designation/establishment of a single organization to provide policy and oversee the execution of the PHS&T function within DOD would assist in resolving the fragmentation problem which presently exists. Monetary savings and improved efficiency would be gained through elimination of redundant facilities, designs, tests, procedures and documentation among the services. For example:

(1) Car loading/truck loading testing and documentation could be consolidated.

(2) Duplication of container and handling equipment testing facilities could be reduced.

(3) Container acquisition could be streamlined and consolidated.

(4) The use by more than one service of the same basic commodity would not result in different container designs for that commodity.

(5) Maintenance philosophies/plans could be reviewed and standardized.

(6) Design and maintenance technologies could be exchanged.

(7) Refurbishment procedures/documentation could be reduced.

(8) There would be a single DOD voice on civilian regulatory issues, including those proposed by DOT, EPA, and the UN.

(9) Sharing of data, e.g., Container Design Retrieval System, would be enhanced.

(10) Duplicative effort in management of equipment could be reduced.

(11) A single location would be provided to which industry could turn for answers to its PHS&T questions.

B. The organization established must be at a level where policies and procedures established by the organization are binding upon all services. For this reason, the organization should be a separate DOD office activity.

C. The policy and oversight organization would benefit from being collocated with a service organization which is presently responsible for the PHS&T function within that service.

(1) Collocation would provide readily available design, engineering, acquisition, and maintenance expertise to the policy making organization. Such expertise would be used to review, verify, and/or certify policies and procedures under consideration or promulgated. In essence this organization would be responsible for such things as technical and process improvement technology, certifying container maintenance and repair activities, and providing technical expertise in the packaging arena.

(2) Location at NWS Earle, Colts Neck, NJ would have the following advantages:

(a) Proximity to major service organizations dealing with PHS&T.

(b) NWS Earle already functions as the Program Manager for PHS&T for the Naval Sea Systems Command and as the Conventional Ordnance Systems Manager for the Naval Air Systems Command.

(c) NWS Earle is the only activity within DOD that has complete in-house facilities/resources/capabilities at one location; thus it is capable of carrying a project from the R&DT&E stage through acquisition to In Service Engineering (ISE).

(d) NWS Earle currently functions as POC for Performance Oriented Packaging (POP) for USN.

(e) NWS Earle has in-house design and test facilities.

(f) NWS Earle has tri-service lead in MIL-STD-648, Design Criteria for Specialized Shipping Containers, and MIL-STD-1365, General Design Criteria for Handling Equipment Associated with Weapons and Related Items.

(g) NWS Earle interfaces with DOT/UN/EPA on all Navy weapons packaging.

D. Assuming that the organization will be a DOD activity located at NWS Earle, a proposed organization is attached at Enclosure 1. The Director for DOD PHS&T would set policy and coordinate tri-service PHS&T efforts. The Deputy Director for PHS&T would act in the Directors absence. In addition, he would be responsible to the Director for overseeing the maintenance functions performed by the service depots.

E. The DOD organization would include representatives or liaison officers from all services.

(1) These liaison officers would be responsible for providing input to the policies and procedures being developed as well as carrying technology improvements back to their respective services. If the DOD organization is collocated with a service PHS&T activity, the head of that service PHS&T activity could function as that services liaison officer.

(2) Current Army, Navy and Air Force PHS&T activities would remain in place, at least initially.

F. A DOD PHS&T Policy Council, consisting of the service liaison officers as well as the Deputy Director for Depot Maintenance, would provide advice and recommendations to the Director for PHS&T.

G. Increased staffing requirements are as follow:

(1)	Office of Director for DOD PHS&T	- 3	
(2)	Office of Deputy Director for PHS&T and Depot Maintenance	- 5	
(3)	Army LNO	- 3	(Funded by Army)
(4)	AF LNO	- 3	(Funded by AF)
(5)	Navy PM (Increase only)	- 1	(Funded by Navy)
	Total	- 15	

H. Cost to implement:

(1) Increased staffing: 900K
(15 @ 60K)

(2) Travel 200K
Subtotal 1,100K

(3) Facilities: Facilities can be made available at NWS Earle to house and support the proposed DOD activity.

(4) Operating costs:
ISSA 200K
Programmatic 200K
Subtotal 400K

(5) Total Cost - 1500K

I. Milestone Chart to implement is attached at Enclosure 2.

4. Conclusions:

A. The establishment of a central agency for PHS&T functions would improve the execution of those functions, create savings, and enhance efficiency. The results would be:

(1) An increase in functional expertise at some PHS&T activities.

(2) Elimination of a variety of approvals, waivers, etc.

(3) Assurance that all services are receiving the benefits of the latest technology.

(4) Establishment of a single point of accountability to OSD.

(5) Provision of a clearing house for all services, FMS customers, and commercial activities.

B. The agency should be collocated with a service field activity. The most likely location is at NWS Earle since it currently is responsible for most Navy PHS&T.

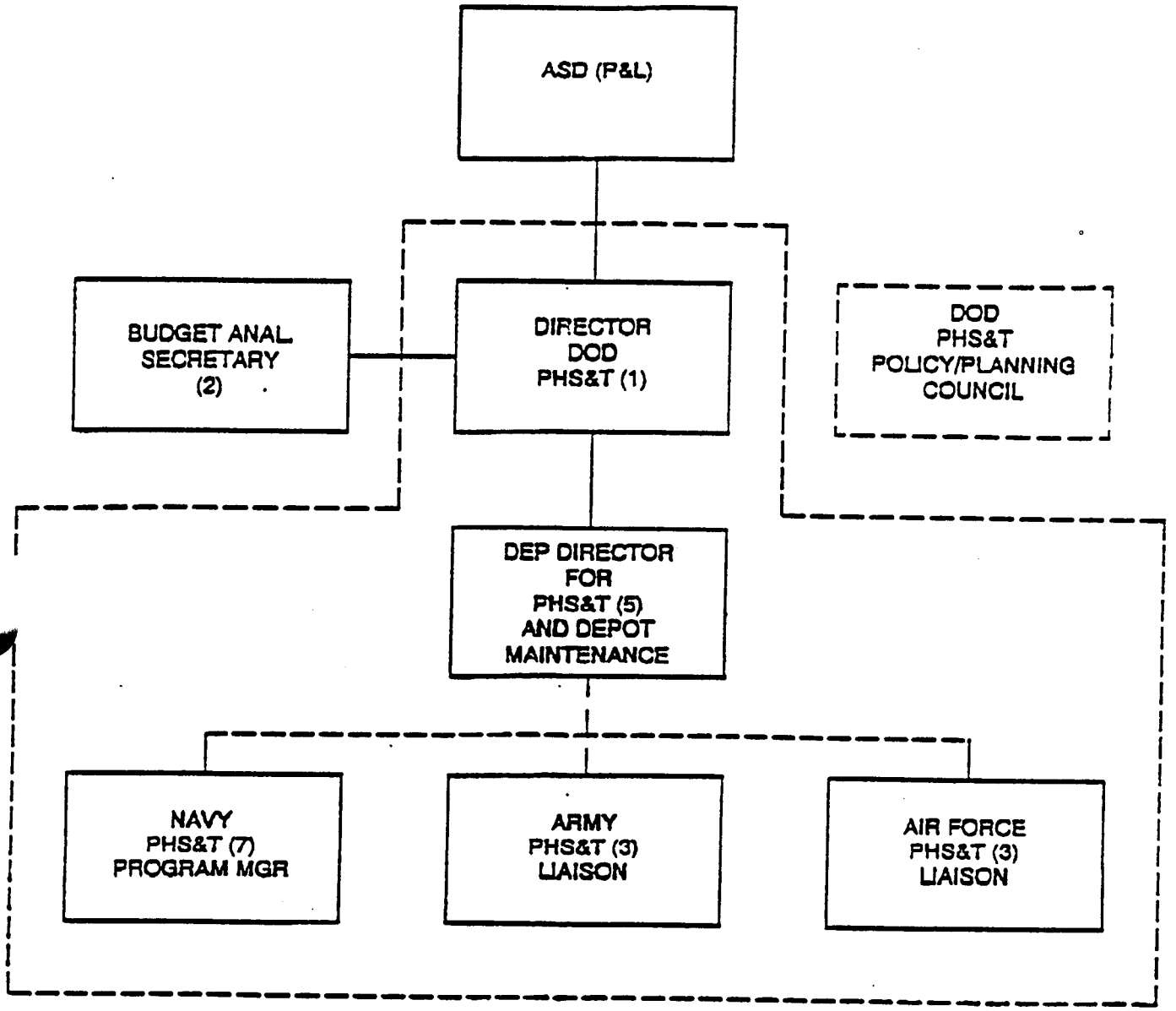
C. The staffing and funding estimates shown are rudimentary. Further study is required to develop detailed facility, staffing, and funding requirements as well as implementation milestones.

5. Recommendations:

A. That a Director for DOD PHS&T be designated, with his office to be established as a tennant activity at NWS Earle, Colts Neck, NJ.

B. That the Director for DOD PHS&T be responsible for establishing policy and procedures relative to the PHS&T functions for the DOD. This responsibility includes that of reviewing and standardizing service policy and procedures.

Organization of Office of Director for DOD PHS&T



POA&M for Consolidation of Tri-Service Packaging, Handling, Storage and Transportability Functions

Phase	Months After Beginning of Implementation Study											
	1	2	3	4	5	6	7	8	9	10	11	12
I Implementation Study Complete		▲										
II DOD Approval Granted for Organization			▲									
III • PHS&T Director Assigned				▲								
• Deputy PHS&T Director Assigned					▲							
• Director Staff Assigned					▲							
• Deputy Director Staff Assigned						▲						
• Army and Airforce Liaison Principals Assigned/ Inplace						▲						
• Army and Airforce Liaison Staff Assigned							▲					
• PHS&T Policy Council Operating							▲					
IV DOD PHS&T Charter Approved									▲			

DoD SMALL ARMS STUDY

PREPARED FOR:

DEFENSE DEPOT MAINTENANCE COUNCIL

22 January 1991

FOREWORD

The Defense Depot Maintenance Small Arms Study Group included highly experienced, knowledgeable and capable depot maintenance professionals from each of the services. Although divergent interests and objectives sometimes understandably existed, the unbiased and dedicated commitment of all study group members was extremely commendable and is much appreciated.

This report documents the following three realities. First, that the existing small arms depot maintenance program and structure basically meets national security needs in an economical, effective, efficient, and responsive manner. Second, consolidation and interservicing are at the maximum level that can be reasonably expected and desired. Third, the overall small arms program is not a fertile field for finding either highly significant cost savings or increased efficiencies.

This report only contains three recommendations. No great changes are offered. No extraordinary findings are provided. The existing small arms program is valid. The recommendations are aimed at further refinement and continuous improvement to this small but vital element of national defense organization.

J. A. Wilson
Colonel
United States Marine Corps

EXECUTIVE SUMMARY

Department of Defense Small Arms Study

1. The Defense Depot Maintenance Study Group was chartered in late July 1990 by the Defense Depot Maintenance Council. The Group mission was development of small arms strategy within the Department of Defense to include a number of specific objectives. These objectives included reduction of operating costs, decrease of transportation costs, limit of future facilities expenditures, and increase of utility while concurrently achieving consolidation and enhanced efficiency and increase of interservicing and competition with respect to workload.

2. The study group commenced analysis on 09 August 1990 and completed the final report on 22 January 1991. Site visits were made to each involved depot by all ten study group members. These visits were spread out over several months in order to allow study group members full opportunity to keep pace with their regular job assignments concurrent with their study group duties. This method also allowed time for data collection, assimilation, and interpretation.

3. The minuscule small arms program value is microscopic in relation to the overall depot maintenance program. For example, the current small arms program value is approximately $13.4 million compared to the overall DOD-wide program of over $13 billion. <u>This is only one-tenth of one percent!</u> The very smallness of the program, in terms of dollars alone, precludes achievement of significant cost savings. Despite this reality, the study group vigorously pursued an in-depth examination of the DOD small arms program in accordance with the assigned mission. This review resulted in the following conclusions:

a. That small arms workload assignments and distribution have been relatively sound since the late 1970s. This condition resulted from the fact that a Joint Logistics Commanders (JLC) previously chartered study group published a report in August 1977. This report provided the foundation for interservicing and consolidation actions. This led to achievement of an efficient overall small arms program within DOD. Depot Maintenance Interservice Agreements were put into effect. Joint Depot Maintenance Analysis Group (JDMAG) decisions have further solidified the program.

b. That the existing small arms program is already virtually consolidated at Anniston Army Depot, Anniston, Alabama. For example, 92% of the FY91 overall small arms depot maintenance program value is located at ANAD. That is, $12.326 million out of a possible $13.404 million is consolidated at ANAD for FY91. The same consolidation percentage applies for FY92. Additionally, from an interservice standpoint, all Navy work is consolidated at Naval Weapon Support Center (NWSC), Crane, Indiana. Also, the U. S. Coast Guard small arms work is done at NWSC, Crane. The Marine Corps small arms workload is centrally managed at Marine Corps Logistics Base (MCLB), Albany, Georgia and executed at both Albany and MCLB, Barstow, California. The Marine Corps, however, interservices over one-half of their small arms workload to either Crane or ANAD. The vast majority goes to the Army at ANAD.

c. That the DOD small arms program is already reasonably interserviced. That the program shows interservicing progression to an achievement of over 12% interservicing by FY94. Adoption of the recommended Air Force transfer of workload subsequently contained herein would further increase interservicing.

Desert Storm rapid support accomplishments, further illustrate the basic validity of the current DOD small arms program. Furthermore, additional interservicing and/or consolidation beyond that recommended herein would be counterproductive to mission accomplishment.

e. That there is no economic advantage to change the existing DOD small arms program beyond the minor "fine tuning" recommended by this study group.

f. That the above conclusions notwithstanding, benefit would be realized by one further consolidation of workload. Specifically, transfer of the Air Force small arms program from Hill AFB in Ogden, Utah to ANAD. This action would result in $17,000 cost savings per year commencing in FY92.

3. It is important to recognize that the above conclusions were reached with only minimal consideration afforded the subject of core capability and core retention. Full application of core would clearly further strengthen the premise that the current small arms program is basically valid. Depot maintenance for small arms is already efficiently consolidated, interserviced, and responsive to the needs of the customer, the individual soldier, sailor, Marine, and airman. "If it ain't broke, don't fix it."

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1. STUDY METHODOLOGY

a. Background:

As a result of Deputy Secretary of Defense Memorandum of 30 June 1990 (Subject: Strengthening Depot Maintenance Activities), Assistant Secretary of Defense (Production and Logistics) Memorandum of 20 July 1990, and the Defense Depot Maintenance Council (DDMC) Meeting of 24 July 1990, over 20 study groups were formed to help develop the future "vision" of DOD depot maintenance. Pursuant to the lead service assignments published by the DDMC, Colonel J. A. Wilson, USMC, Director, Depot Maintenance Activity (DMA), MCLB, Barstow was assigned chair of the DOD Small Arms Strategy Development Group (also known as the Defense Depot Maintenance Small Arms Study Group). CMC Washington D.C. message 020243Z Aug 90 refers.

The initial group meeting was 9-10 August 1990. At that time small arms definition for the purpose of this study was agreed upon, an in-depth data call and a study checklist were developed, and an itinerary for the required depot visits was determined. CG MCLB, Barstow message 131951Z Aug 90 applies.

The study methodology evolved over time as knowledge increased and direction regarding report format became increasingly precise. Specific procedural guidance developed during commodity group study leader visits to Joint Depot Maintenance Analysis Group (JDMAG), Gentile AFS, Ohio on 16 October and 17-18 December 1990. The latter JPCG-DM Service Executive Group/DDMC Study Group Leader meeting was especially valuable with respect to exact formats for the commodity study groups. For example , explanation was given for the comparability/bid proposal worksheet and the weapon system matrix. Also, at the mid-December meeting, information concerning the generic study groups and their progress was provided to the commodity study group leaders. Of particular importance was the briefings relative to the Cost Comparability Handbook and the status of individual service positions regarding core quantification.

b. Scope:

To develop a recommended depot maintenance strategy for small arms within the Department of Defense. This includes reducing depot maintenance operating costs, decreasing transportation costs, limiting future facilities expenditures, and increasing utility while retaining a core capability through

competition, consolidation, enhanced efficiency and utilization, and interservicing of workload among the four services.

c. Assumptions:

The following assumptions apply throughout this study:

1. Quality of end item produced is equal
2. The items that constitute 80% of the program offer an adequate sample to draw conclusions
3. Small overall program dollar value inhibits significant cost savings
4 The "playing field" can be leveled amongst services by using the Cost Comparability Handbook

d. Definition:

The following definition of small arms is taken from DOD 4400.25-M-2, MILSTRAP Manual and was agreed upon by all members of the study group during the initial meeting.

"The small arms are defined as handgun; shoulder-fired weapons; light and automatic weapons up to and including .50 caliber machine guns; recoilless rifles up to and including 106mm; mortars up to and including 81mm (excluding 81mm and 60mm shipboard installed types); rocket launchers, man-portable; grenade launchers, rifle and shoulder-fired; and individual operated weapons which are portable and/or can be fired without special mounts or firing devices and which have potential use in civil disturbances and are vulnerable to theft. Listed below are specific types:

1. Automatic rifles
2. Carbines
3. Flame throwers (portable)
4. Launchers, grenade (excluding those integral to another weapon system)
5. Launchers (portable and reusable)
6. Line throwing (portable)
7. Machine guns/cannons (all types up to and including .50 caliber)
8. Mortars
9. Pistols (all types including signaling)
10. Recoilless rifles
11. Revolvers
12. Rifles (all types including spotting)
13. Shotguns
14. Submachine guns

The above does not include 20-40mm weaponry that is integral to other principal end items such as the Bradley Fighting Vehicle, Light Armored Vehicle, various aircraft, and ships."

Subsequently, the Army offered a new perspective concerning the agreed upon small arms definition. Specifically, it was recommended that the team also consider the 20-40mm weapons from air defense aircraft and Bradley Fighting Vehicles, etc. Although, the aforementioned recommendation was never denied , it eventually became essentially excluded from the study by virtue of practicality. That is, since at least one other major study group was already considering the recommended weaponry as part of its study and since the interrelatedness of the weapon and principal end item is inextricably interdependent, this area was beyond the range of practical analysis.

e. Analytical Factors:

Cost and non-cost factors impacted this study. Although the lowest unit cost to the customer is the vehicle to tangible savings, cursory analysis produced these factors:

COST	NON-COST
-unit price	-core
-hourly rebuild standard	-rebuild standards (DMWR)
-material costs	-size of Army program
-transportation cost	-condition of asset
-overall program value	-previous small arms study decisions (JDMAG)

f. Study Group Members:

MEMBER	ASSIGNMENT	SERVICE
COL J. A. Wilson	Chairman	USMC/DMA, MCLB, Barstow, CA
LTCOL A. C. Akstin	Alternate	USMC/HQMC, Washington DC
MR. J. C. Fuqua	Primary	USA/AMCCOM, Rock Is,IL
MR. R. E. Brown	Primary	USN/NAVSEA, Washington DC
MR. D. W. Maycroft	Primary	USAF/ALC, Warner-Robins AFB, GA
MR. R. T. Stewart	Member	USA/ANAD, Anniston, AL
MR. L. Waltz	Member	USN/NWSC, Crane, IN
MR. G. Dornick	Member	USN/NWSC, Crane, IN
MR. G. A. Betournay	Member	USAF/ALC, Hill AFB, Ogden, UT
1LT T. R. Noonan	Member	USMC/DMA, MCLB, Barstow, CA

g. Site Visits

Site visits included all depots in DOD that perform depot maintenance of small arms. Each service was represented at each site visit.

Site	Dates
Depot Maintenance Activity (DMA), MCLB, Barstow, CA	9-10 Aug 90
	15-18 Jan 91
Naval Ordnance Station (NOS), Louisville, KY	11 Sep 90
Naval Weapons Support Center (NWSC), Crane, IN	12 Sep 90
Anniston Army Depot (ANAD), Anniston, Alabama	25 Sep 90
Depot Maintenance Activity (DMA), MCLB, Albany, GA	26 Sep 90
Hill Air Force Base, Ogden, UT	17-18 Oct 90

Additionally, visits to JDMAG, Gentile AFS, Dayton, OH were made by the Chairman on the following dates:

16 Oct 90
17-18 Dec 90

h. Data Sources:

Data was requested form each service based on the Chairman's data call requirements. The following was requested and received from each service:

1. Small arms facilities data
   -including size, workstations, facilitization projects, equipment, etc
2. FY90 workload data
3. FY91-FY95 workload data (funded and unfunded)
4. Rebuild data for M16, M249, M60, M2
   -including hourly standard, DMWR, total cost
5. Detailed bill of material for M16, M249, M60, M2

The following data was also collected from other sources:

1. Joint Depot Maintenance Analysis Group (JDMAG) decisions involving small arms
2. National Registry list of small arms by NSN and service
3. Summary Report for the DARCOM/NMC/AFLC/AFSC/USMC Maintenance Interservice Support Management Offices' Ad Hoc Work Group on Small Arms, 15 Aug 1977

2. DISCUSSION

a. History

In order to understand the present environment of small arms rebuild in DOD, an overview of previous efforts and their status is warranted.

In May 1973, the Assistant Secretary of Defense (Installation and Logistics) tasked the Joint Logistics Commanders (JLC) to develop an interservice, depot maintenance strategy. The goal of this effort was to consolidate common maintenance functions and assess potential of interservicing 11 major commodity groups including small arms, much in the manner of the present study groups.

The small arms study group was formed in October 1974.

The finished report was published 15 August 1977. This report substantiated data included in an April 1976 intra-Navy memorandum which included a list of Small Arms and Weapons Interservice Studies, early JDMAG decisions. These interservice decisions were confirmed with present JDMAG data, computer generated 19 April, 1990.

Based on these reports, Depot Maintenance Interservice Support Agreements (DMISA) were put in place. Many of these DMISAs are still being utilized.

Each service still provides its own intermediate or Fourth Echelon maintenance. This is accomplished by the fleet armorers in the Army, Marine Corps, and Air Force. NWSC, Crane performs all intermediate maintenance in the Navy.

The study resulted in consolidation of all Army workload into ANAD and all Navy workload into NWSC, Crane. The Marine Corps maintained two facilities while the Air Force has only one. Also, 27 decisions affected the small arms program.

These previous decisions allowed the Army to work its full inventory of infantry weapons. The Navy became the consolidated depot for working security type weapon, revolvers and shotguns, and their basic rifle, the M-14. The Marine Corps maintained its entire capability to meet its specific operational commitments. The Air Force could work some of their security weapons.

In 1988, the Coast Guard consolidated small arms repair with at NWSC, Crane. The Coast Guard vacated their Brooklyn, New York location to lower security costs and receive utility

benefits from consolidation at Crane. The Coast Guard is able to ship and store weapons, and maintain parts using the Navy systems.

Presently, the program size of small arms in relation to the depot maintenance industry is small, $13.487 million of a total $13 billion depot maintenance industry or .1037% in FY91. That is correct, only one-tenth of one percent! The Army is the dominant force in the program accounting for $12.326 million of the $13.487 million or 91.39% of the program dollar value in FY91. This entire workload is being performed at ANAD. In essence, the total DOD small arms workload is virtually consolidated at Anniston Army Depot, Anniston, Alabama. Enclosure (1) graphically represents this reality for FY92.

Presently, there are 212 small arms serialized NSNs for the four services. These 212 NSNs are considered small arms per the definition.

Considering the size of the program, the dominance of the Army within this program, previous studies conducted, and essential consolidation already taking place, it became the goal of this study group to find additional DOD-wide benefits within an already streamlined and definitively structured program. Thus, the need for extensive in-depth and detailed analysis of specific selected weapon systems and associated processes. This type of analysis was undertaken by the small arms study group.

b. Data Call

The following represents data collected throughout this study:

-Workload FY91-FY95 (Note consistent Army dominance and overall reduced funding levels after FY92.)

Based on funded workload (dollars in millions).

	FY91	FY92	FY93	FY94	FY95
ARMY	12.326	13.113	5.552	5.117	4.917
NAVY	.630	.707	1.019	1.022	.958
USAF	.263	.182	.183	.181	.178
USMC	.268	.287	.227	.311	.348
TOTAL	13.487	14.289	6.981	6.631	6.401

-Interservicing (Note the total program eventually achieves greater than 10% interservicing.)

Only the Army and Navy perform workload for the other services (dollars in thousands).

The Army accomplishes the following workload for:

	FY91	FY92	FY93	FY94	FY95
USMC	166,122	97,650	57,356	109,458	102,570
USAF	22,000	93,000	89,000	87,000	84,000
NAVY	0	0	238,268	241,438	40,740
TOTAL	188,122	190,650	384,624	427,896	227,310

The Navy accomplishes the following workload for:

	FY91	FY92	FY93	FY94	FY95
ARMY	0	62,000	156,000	310,000	465,000
USAF	7,000	32,000	37,000	37,000	37,000
USMC	14,958	14,958	14,958	59,832	59,832
TOTAL	21,958	108,958	207,958	406,832	561,832

GRAND TOTAL:

210,080	299,608	592,582	834,728	789,142

PERCENTAGE OF PROGRAM:

1.57	2.10	8.49	12.59	12.33

-Capacity

Capacity measurements were taken to gauge the utilization of the small arms work area with the separate depots. Exact measurement is neither possible nor particularly meaningful since each depot situationally shifts workers from small arms to "heavy guns" (artillery or 20-40mm guns). Additionally, capacity measurements vary each fiscal year for each service and depot. At no time does capacity exceed 53% for any depot, however, recommendations herein, slightly, increase overall DOD capacity utilization. Slight increases are all that are possible given that the program is already highly consolidated.

-JDMAG Decisions

Presented are JDMAG decisions that affect the small arms community resulting from the 1977 study:

NO	SYSTEM/ITEM	AGENT
1-1	Revolvers, .38 cal	Crane
1-2	Launcher, Grenade M-79	Crane
1-3	Pistol, Pyrotechnic M-8	Crane
1-4	Rifle, M14	Crane
1-7	Rifle, 5.56 M16	ANAD, USMC
1-8	Rifle, 7.62 M60	ANAD, USMC
1-9	MG, Cal .50 M2	ANAD, USMC
1-13	Shotgun, 12 gauge	Crane, USMC
1-14	Pistols/Rifles Cal.22	Crane
1-15	MG, 40mm MK19	NOS, Louisville
1-19	Pistol, Cal .45	ANAD, USMC
1-23	MG, Cal .50 M85	ANAD, USMC
1-27	Launcher, Grenade M203	ANAD

-Facilities

-All facilities have adequate equipment to accomplish workload.
-USMC lacks body bond riveting machine. USMC M60 receivers, for example are repaired at ANAD.
-DMA, Barstow lacks anodizing capability for aluminum parts
-DMA, Albany will have indoor range capability for targeting and acquisition and cycle timing capabilities.
-NWSC will have indoor range capability
-NWSC will have M9 pistol slide stress test capability
-Skilled labor base is adequate in all services
-Both historical and current physical evidence of quality production at all facilities visited

-Factors

-Few components associated with rebuild
-Depot maintenance is basically parts replacement, stripping, painting, testing, inspection, and corrosion control.
-Likeness of weapons ensure industry knowledge (sameness of M60, M249, M2). That is skill to repair M60 or M1911A1, .45 cal pistol could be used to repair M2 or M9, 9mm pistol.
-Consequently, exact item core quantification for each small arm is of lesser significance than for major principal end items such as aircraft or tanks.

3. ANALYSIS

Small Arms can be broken into subcategories based on mission. The Marine Corps and the Army use small arms to outfit the rifle battalion as the basic organizational weapon. Small arms weaponry is also of strong importance to combat support and

combat service support units in both the Army and the Marine Corps. This includes individual and crew serve weapons from service pistol to heavy machine guns and mortars. The Air Force and Navy primarily utilize small arms for security and special warfare uses, although, the Seabee Battalions are outfitted, basically, as a Marine Corps rifle battalion. These security weapons include a large inventory of revolvers and shotguns, along with the service rifle, M16, and special warfare weapons that have a special repair needs. The Army and Marine Corps also use these cross-service security weapons.

With history, background, and data call in place, the analysis will be presented in three parts. First, an analysis of infantry weapons repaired by the Army and Marine Corps and conclusions. Second, an analysis of Navy weapons and JDMAG decisions. Third, a like analysis will be applied to Air Force weapons. Fourth, an analysis of USMC transportation cost relative to consolidation of USMC workload.

A. Army and Marine Corps-Infantry Weapons

The first analysis focuses on the Army and Marine Corps weapons. Four weapons, M16A1/A2, 5.56mm rifle; M249, 5.56mm squad automatic weapon; M60/E3, 7.62mm machine gun; M2, .50 cal machine gun, comprise 66.47% of the program in FY91 and 69.32% of the program in FY92 ($8.910 million in FY91, $9.910 in FY92). Adding the M203, 40mm grenade launcher, raises figure to 73.21% and 73.32% respectively. ANAD repairs 100% of this M203 workload. In FY90, ANAD repaired 467 M203s at a cost of $379,500 for the Marine Corps.

A variety of other weapons, M911A1, M9, M224, can push the percentage up to the desired 80% range. These items are either worked in small quantities or have a low unit repair cost. The aforementioned five weapons constitute the major T/O weapon of the respective service and will serve as the focus of this analysis.

The weapons are compared "head-to-head", breaking out rebuild hours, hourly rates, bills of material, and extenuating circumstances. Rates representing the Marine Corps are from DMA, Albany.

This analysis used the format of the Cost Comparability Handbook and streamlined the Cost/Bid Proposal Worksheet into a manageable format for this particular problem.

(1) M16A1/M16A2

Although the Army uses the M16A1 and the Marine Corps uses the M16A2, both weapons are rebuilt to the same DMWR, # 9-1005-249. Referring to enclosure (2a), the USMC has a slightly higher rebuild standard by .43 hours. Using the Cost Comparability Handbook the "playing field" was leveled. Per unit rebuild costs are $248.76, Army and $217.91, USMC. A delta of $30.85 exists.

Comparing bills of material and replacement factors it is evident that the Army replaces the lower receiver when the Marine Corps does not ($19.46) and replaces the upper receiver 35% more of time ($12.52). This closes the material cost difference gap of $37.04 by $31.98.

The Army has authority to replace the receiver while the Marine Corps turns-in the receiver for an entire new weapon. This process not only lowers material costs, but allows for cannibalization of parts for the rebuild process.

(2) M249

Being new to the depot arena, little data is available for the M249. It comprises only $252,000 of workload in FY91 and FY92. The Army has never rebuilt this item and a pilot program is being initiated. No DMWR exists, only a statement of work dated 26 Jan 1989.

(C) M60/M60D/M60E3

Using the same analysis , the M60, M60D, and M60E are rebuilt to DMWR # 9-1005-224. Referring to enclosure (2b), The Marine Corps uses the M60E3, while the Army has a preponderance of the other variants. The hourly standard is different by 1.42 hours. This delta is attributed to the USMC waiver for testing and accuracy firing of this weapon. The Army uses 1.5 hours to accomplish this task.

After comparability, a delta of $535.36 exists in per unit cost. The bill of material comparison yields a difference of $579.31. The Army replaces the receiver ($279.72) and has higher replacement factors for the barrel ($209.25). These two factors parts close the gap by $488.97. Cannibalization of parts is a significant factor.

(4) M2

The M2 is used by both the Army and the Marine Corps without variations. The difference of 2.22 hours in the rebuild standard is associated, again, with the Marine Corps' waiver to T&A the weapon. Enclosure (2c) applies.

After comparability, a difference of $430.22 exists in the unit cost. This is close to the difference in material costs, $448.26. The replacement of the receiver alone, 461.50, reconciles this difference.

The barrel ($102.25) also adds to this difference. Cannibalization can explain low replacement factors for the Marine Corps.

(5) Conclusion

The cost to rebuild weapons in the Marine Corps and the Army are statistically equal. Differences in standards and procedures produce cost differentials that have been quantitatively and qualitatively measured and are also relatively equal. As this workload represents 65% of the program, intuitively the comparisons will hold true for other weapons. No economic advantage or cost benefit could be realized from changing the distribution of workload. As the work complies with a standard, repair is parts replacement, and no subsystems exist, economies of scale have been attained at two separate facilities having distinct processes with different utilization/capacity percentages. In other words, both services have attained the most efficient processes for small arms repair through years of rebuild experience and refinement of procedures. Furthermore, the Marine Corps already interservices $166,620 to ANAD in FY91 and $97,750 in FY92. Making up, respectively, 61,99% and 34.06% percent of the total Marine Corps program. Retention of core capability is essential to service mission accomplishment.

B. Navy-Security Weapons

Referring to enclosure (3), the Navy FY91 workload consists primarily of revolvers and shotguns, various types, comprising $262,311. M79 grenade launcher comprises $131,972 and rebuilding a special machine gun soft mount is $110,884. This comprises $505,167 of a workload of $670,000. The rest of the workload is in small caliber rifles. Similar figures appear in the out years.

As seen in this enclosure, the Navy workload is primarily comprised of the security weapons, shotguns and revolvers. The Navy is the only DOD entity that accomplishes this type of work. Shotguns, revolvers, and M79 grenade launchers from the Air Force are worked at NWSC, Crane. The Marine Corps has the capability to rebuild shotguns, but the workload is only 32 units in FY91-FY93 at price differential of $13.00 per unit.

NWSC, Crane also performs an intermediate repair function at the facility, using the same employees and administrative services.

C. Air Force-Security Weapons

The Air Force depot maintenance capability, Hill, AFB, UT is geographically dislocated from the Inventory Control Point for small arms, Warner-Robins AFB, GA. A transfer of USAF small arms repair capability to either ANAD, Anniston, AL or MCLB, Albany achieves consolidation and interservicing of the Air Force workload while simultaneously accomplishing economic advantages and cost benefits.

Comparison was made between USAF and ANAD vice DMA, ALbany since ANAD possesses the greater actual capacity as well as capacity underutilization. Also, as shown elsewhere in this report, cost differences between Army and USMC are attributed to procedural differences which represent minor cost differences.

Enclosures (4a) through (4e) compare the rebuild costs of the specific weapons that the Air Force rebuilds. ANAD presently has M16 rebuild capability. As can be seen, savings would amount to $38,500 in FY91 and $19,150 in FY92.

The GUU-5P, M1, and ANM M3, .50 cal machine gun are currently being worked at Hill, AFB. ANAD has not worked these weapons in recent years. Comparisons were based on Air Force hourly standards and material costs applied to ANAD hourly rates. Negative savings resulted. This is to be expected based on the learning curve to repair these systems. Economies of scale premised on the cadre of knowledgeable personnel and improved processes should lower the cost in the out years.

There is negative savings associated with the M203 rebuild program also. This negative savings is minimal, and the volume of assets worked do not offset the utility that would be gained through this consolidation and interservicing.

Transportation requires Armed Guard Service (AGS) and Motor Satellite Surveillance (MSS). The cost to transport the a 10,000lb load from Warner-Robins, AFB, GA to Hill, AFB, UT is $1,963 one way. Round trip transportation from Warner-Robins to ANAD is $1,370. A cost savings would result in $593 per year. Weapons are usually shipped quarterly, therefore a cost savings of approximately $2,000 annually. (Based on shipments of 10,000 lbs.)

Other cost and non-cost factors include the removal of a high-technology security system. This would lower overhead costs. Overhead would be lowered by not having to utilize armed guards in the work place and in transporting weapons. Also, a need would no longer exist for explosive storage requirements and subsequent regulations. Fixtures, special tooling, and ordered parts could be transferred to ANAD. There are no job losses associated with this transfer. Workers in small arms would be transferred to meet workload requirements in aircraft ordnance maintenance (20-40mm guns). A bullet trap was purchased but not yet received. It could be returned for credit or transport to ANAD.

There is a possibility of transferring the M197 20mm automatic gun from Alameda Naval Air Station to Hill AFB. Alameda is scheduled to be closed and this weapon is a three barrel version of the M61, M61A1, and M168 currently being worked at Hill for the Army, Navy, and USMC. Realizing these weapon systems are out of the scope of this study, it may be worth pursuing through other channels.

The transfer of workload from Hill to ANAD achieves consolidation, interservicing, and some cost benefit. It will be shown this has little effect on USAF core. Not practical, savings will accrue to approximately $17,000 per year in the out years. FY91 data was used as best available at the time of this report.

D. USMC Transfer

Transferring USMC workload from Barstow to Albany would result in only minor consolidation. As both DMAs are colocated with supply depots, there is no present transportation cost associated with inducting assets. Transportation costs from coast-to-coast would be approximately $1000.00 per shipment. As assets are worked based on need throughout the Marine Corps, a consolidated shipment is not possible. Consequently, any internal DMA savings become offset by transportation costs. Geographical location facilitates flexible and rapid response to the respective expeditionary force located in the same area.

No cost benefit, economic advantage, logistic capability enhancement, or practical improvement would be accomplished by consolidating the workload. In fact, such a move increases costs and decreases responsiveness.

4. OTHER FACTORS

Non-cost factors also impacted this study. First, contracting to private firms was investigated. Currently, the M24 Sniper weapon is the only small arms depot maintenance program being contracted. This contract was required due to lack of organic capability/technical documentation (i.e., custom fitting of parts, technical data rights). During the last year, Saco Defense was the only contractor who expressed an interest in performing depot maintenance of small arms. Based upon excess organic capacity at ANAD, AMCCOM declined to pursue this option further. As a part of this study, AMCCOM procurement Directorate contacted Colt Manufacturing Company, Fabrique Nationale Manufacturing Incorporated (FNMI), and Beretta USA Corporation (BUSA). These companies were all receptive to further discussion on only weapons they produced, therefore realizing minimal contribution from any one company. They also indicated their interest was conditionally dependent upon actual scope of work which entailed inspecting each weapon prior to acceptance. Considering the size of the small arms program workload, declining depot funding, and core capability, competitive procurement with private firms was not considered warranted.

The possibility of private competition is also hampered by specific requirements for small arms security, transportation, and serialization. The serial service transportation and serial number tracking requirements are deterrents to contracting. Past experience proves that some contractors do not have appropriate secure storage and secure workplace requirements to meet DOD guidelines. Also, the services are required, due to the pilferable, portable, and sensitive nature of small arms, to use signature service transportation and to track each small arm by serial number from origin to destination, including movement to any demilitarization facility. These factors place an administrative burden on the services which could only be offset by large competitive differentials offered by private firms.

Small arms capability in support of Desert Storm has been significant. Each service has made the following contributions, which were high priority, quick response jobs:

a. ARMY

-ANAD began accelerated production of M16A1 rifles and M60 machine guns in early Oct 90. Production in creased from 3,000 M16A1s per month to 4,200 and M60s from 100 to 200.

-ANAD was tasked to provide a 45 day level of supplies and necessary equipment to provide intermediate level maintenance in Southwest Asia.

-Approximately 35% of ANAD's small arms workforce is presently in Southwest Asia. Remaining personnel continue to accomplish accelerated production schedules and respond to quick reaction requirements by virtue of 12 hour/7 day work shifts

-ANAD was tasked on 04 Jan 91 to have 5000 each .45 cal pistols repaired and shipped to Southwest Asia no later than 14 Jan 91. Effort was accomplished.

-ANAD responded to approximately 35 quick reaction requirements from various posts, camps, and stations. Average turn around time for these requirements was less than three days.

b. NAVY

-Shipped 36 end items including 7,221 individual weapons, mounts, and modification kits to 105 different commands and ships.

c. USMC

-DMA, Barstow upgraded 3,700 each .45 cal pistols within one week for issue to specific units.
-DMA, Albany produced 15 different end items including 6444 individual small arms for rapid provision to deploying forces.
-Both DMAs went to 12 hour/7 day shifts.
-Both DMAs had intensive quick reaction efforts to rebuild approximately 300 SMAWs.
-Both DMA provided technical assistance to both fleet and reserve establishments.

d. USAF

-Had no special small arms requirements in support of Desert Storm

5. CONCLUSION

Depot maintenance is already consolidated, efficient, and productive. Little cost savings would be realized from added interservicing and consolidation. More importantly, individual service readiness, sustainability, flexibility, front line combat

effectiveness, training, and technology would suffer if the status quo was appreciably altered. Also, modification to the small arms program beyond that recommended herein would severely cut into service core capability.

Desert Storm requirements provided a text book opportunity to prove the existing system. Rapid responses, intrinsic service planning, and coordination was not lost to cumbersome and untimely interservice coordination. Interservicing provided a peace time vehicle to keep inventories at a suitable level to meet contingencies, but the Army, Navy, and Marine Corps still relied on short reaction time, organic capability to mobilize their respective service. As Desert Storm preparations offer an almost worst case scenario to the logistics infrastructure, the realization that the Air Force did not need a small arms capability to meet this crisis lends credence any recommendations for interservicing that would eliminate this services need to maintain a small arms repair capability or core requirement.

6. RECOMMENDATIONS

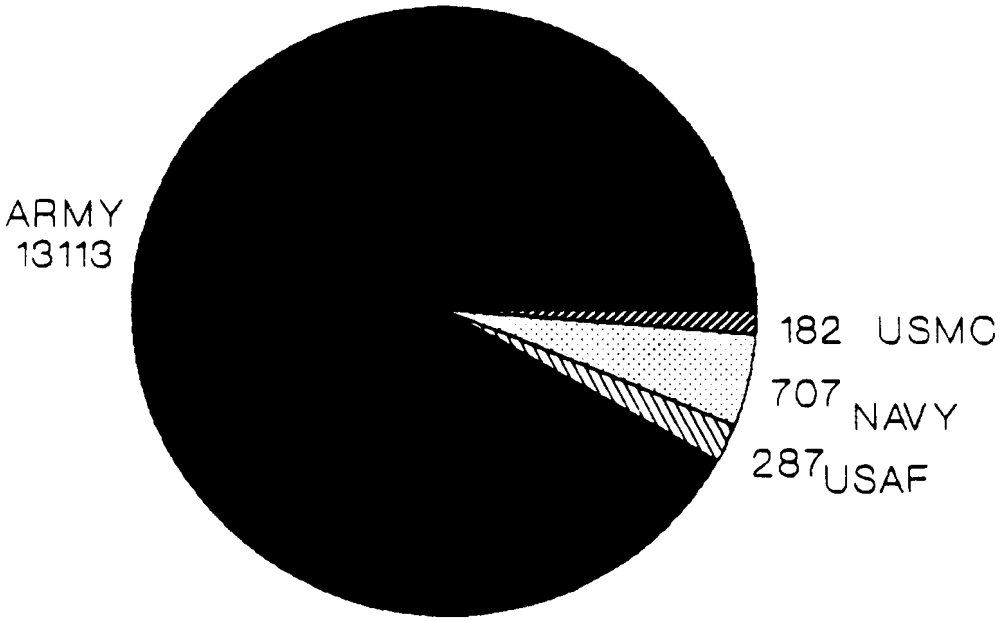
a. Transfer all Air Force small arms workload from Hill, AFB to ANAD. Refer to enclosure (5) for Cost Matrix. FY92 net savings is $17,000.

b. Annually form a depot maintenance study group to exchange knowledge, research asset condition, and coordinate small arms activities throughout DOD. In this regard, communication between services has already produced significant results in support of Desert Storm:

-Navy received 22,000 each M16A1 rifles from the USMC. Cost savings of $981,200 over procurement cost realized.
-Navy, in turn, provided 300 each to Coast Guard. $133,800 saved.
-Navy received 8000 each .38 cal revolvers from USAF. Cost savings of $220,000.
-USMC received 2000 each M9 pistols from Navy. Cost savings of $456,000.

c. As addressed on page 13 herein, consider transfer of M197 20mm automatic gun workload from NADEP, Alameda to Hill, AFB.

Small Arms Workload
FY92



dollars in thousands

COMPARABILITY MATRIX

Weapon M16
Fiscal Yr 91

Service	Army		USMC	
Hours per unit	2.96		3.39	
Cost per	Hour	Unit	Hour	Unit
Cost Category				
Direct Labor	18.50	54.76	17.72	60.07
Direct Material	42.41	125.53	20.88	70.78
Other Direct	3.09	9.15	7.93	26.88
Production Overhead & G&A	23.13	68.46	16.75	56.78
Total IF Cost	87.13	257.90	63.28	214.52
Adjustments				
Supply	2.01	5.95		0.00
Surcharge	1.08	3.20		0.00
FECA		0.00	1.00	3.39
Total Adjustments	3.09	9.15	1.00	3.39
IF Comparability Costs	84.04	248.76	64.28	217.91

Bill of Material

Part	Price	DOF	Cost	DOF	Cost
Barrel Assembly	70.40	0.35	24.64	0.40	28.16
Butt Stock	13.26	1.00	13.26	0.50	6.63
Receiver, Lower	38.91	0.50	19.46	0.00	0.00
Receiver, Upper	35.77	0.60	21.46	0.25	8.94
Hand Guard Assembly	3.92	0.75	2.94	0.25	0.98
Total Material Cost			81.76		44.71
Delta Material	37.04				
Delta Unit Cost	30.85				

Factors: Army replaces lower receiver
Army has higher replacement factor on upper receiver

COMPARABILITY MATRIX

Weapon M60
Fiscal Yr 91

Service	Army		USMC	
Hours per unit	10.87		9.45	
Cost per	Hour	Unit	Hour	Unit
Cost Category				
Direct Labor	18.50	201.10	17.72	167.45
Direct Material	68.99	749.92	27.19	256.95
Other Direct	3.09	33.59	7.93	74.94
Production Overhead & G&A	23.13	251.42	16.75	158.29
Total IF Cost	113.71	1236.03	69.59	657.63
Adjustments				
Supply	2.01	21.85		0.00
Surcharge	1.08	11.74		0.00
FECA		0.00	1.00	9.45
Total Adjustments	3.09	33.59	1.00	9.45
IF Comparability Costs	110.62	1202.44	70.59	667.08

Bill of Material

Part	Price	DOF	Cost	DOF	Cost
Barrel	837.00	0.50	418.50	0.25	209.25
Stock, Gun	59.87	0.33	19.76	0.05	2.99
Receiver	666.00	0.42	279.72	0.00	0.00
Tray Assembly	95.70	0.40	38.28	0.10	9.57
Bolt Breech	77.36	0.83	64.21	0.25	19.34
Total Material Cost			820.47		241.15
Delta Material	579.31				
Delta Unit Cost	535.36				

Factors: Army replaces receiver
Army has higher replacement factor on barrel
USMC waives TA requirement

COMPARABILITY MATRIX

Weapon M2
Fiscal Yr 91

Service	Army		USMC	
Hours per unit	12.72		10.50	
Cost per	Hour	Unit	Hour	Unit
Cost Category				
Direct Labor	18.50	235.32	17.72	186.06
Direct Material	74.36	945.86	56.14	589.47
Other Direct	3.09	39.30	7.93	83.27
Production Overhead & G&A	23.13	294.21	16.75	175.88
Total IF Cost	119.08	1514.70	98.54	1034.67
Adjustments				
Supply	2.01	25.57		0.00
Surcharge	1.08	13.74		0.00
FECA		0.00	1.00	10.50
Total Adjustments	3.09	39.30	1.00	10.50
IF Comparability Costs	115.99	1475.39	99.54	1045.17

Bill of Material

Part	Price	DOF	Cost	DOF	Cost
Receiver	1846.00	0.25	461.50	0.00	0.00
Barrel	409.00	0.55	224.95	0.30	122.70
Extension	193.00	0.35	67.55	0.20	38.60
Bolt	256.00	0.25	64.00	0.90	230.40
Sight, Rear	56.69	0.30	17.01	0.20	11.34
Pin, Firing	5.61	0.73	4.10	0.25	1.40
Cover	136.00	0.10	13.60	0.00	0.00
Total Material Cost			852.70		404.44

Delta Material 448.26
Delta Unit Cost 430.22

Factors: Army replaces receiver
Army has higher replacement factor on barrel
USMC waives TA requirement

ENCLOSURE (2c)

NAVY WORKLOAD FY91-FY92

NOMENCLATURE	PROJECTED FY91			PROJECTED FY92		
	QTY	UNIT REPAIR COST	TOTAL $	QTY	UNIT REPAIR COST	TOTAL $
.38 MASTER	400	244	97600	300	265	79500
38 MOD 10	0	0	0	200	253	50600
38 RUGER	200	235	47000	137	259	35483
.357 MOD 19			0	16	256	4096
.22 MOD 44			0	685	156	106860
M79 GL	100	415	41500	97	464	45008
12 GA M870 SG	150	153	22950	33	170	5610
12 GA MOSSBERG	200	153	30600	10	170	1700
PISTOL MK 5			0	200	154	30800
MOD 36 2BBL	300	242	72600	300	267	80100
RIFLE MK 6-1	250	70	17500	250	90	22500
22 ACE	400	123	49200	14	198	2772
12 GA 17" BBL	149	153	22797	208	170	35360
MG SOFT MOUNT	76	1459	110884	106	1512	160272
SHOTGUN MOD 12	60	256	15360	30	283	8490
SHOTGUN M870	52	372	19344	36	400	14400
M79 GL	12	406	4872	23	440	10120
M79 GL	200	428	85600	100	458	45800
SHOTGUN FOLDING STOCK				23	247	5681
TOTAL			637807			739471

Comparability/Bid Proposal Worksheet

Weapon	M16	
Fiscal Yr	91	
Quantity	FY91	400
	FY92	200

Service		Army				USAF		
Hours per unit		2.96				5.24		
Cost per	Hour	Unit	Project FY91	Project FY92	Hour	Unit	Project FY91	Project FY92
Cost Category								
Direct Labor	18.50	54.76	21904.00	10952.00	16.98	88.98	35590.08	17795.04
Direct Material	15.19	44.96	17984.96	8992.48	8.59	45.01	18004.64	9002.32
Other Direct	3.09	9.15	3658.56	1829.28	0.57	2.99	1194.72	597.36
Production Overhead & G&A	23.13	68.46	27385.92	13692.96	28.05	146.98	58792.80	29396.40
Total IF Cost	59.91	177.33	70933.44	35466.72	54.19	283.96	113582.24	56791.12
Adjustments								
Supply	2.01	5.95	2379.84	1189.92	0.52	2.72	1089.92	544.96
Surcharge	1.08	3.20	1278.72	639.36		0.00	0.00	0.00
FECA		0.00	0.00	0.00		0.00	0.00	0.00
Base Support Costs			0.00	0.00	3.30	17.29	6916.80	3458.40
Total Adjustments	3.09	9.15	3658.56	1829.28	3.82	20.02	8006.72	4003.36
IF Comparability Costs	56.82	168.19	67274.88	33637.44	50.37	263.94	105575.52	52787.76

USAF Cost Savings FY91	38300.64
USAF Cost Savings FY92	19150.32

ENCLOSURE (4a)

Comparability/Bid Proposal Worksheet

Weapon GUU-5P Rifle
Fiscal Yr 91
Quantity FY91 41
FY92 24

Service		Army				USAF		
Hours per unit		4.64				4.64		
Cost per	Hour	Unit	Project FY91	Project FY92	Hour	Unit	Project FY91	Project FY92
Cost Category								
Direct Labor	18.50	85.84	3519.44	2060.16	14.22	65.98	2705.21	1583.54
Direct Material	5.82	27.00	1107.20	648.12	5.82	27.00	1107.20	648.12
Other Direct	3.09	14.34	587.84	344.10	0.00	0.00	0.00	0.00
Production Overhead & G&A	23.13	107.32	4400.25	2575.76	18.97	88.02	3608.85	2112.50
Total IF Cost	50.54	234.51	9614.73	5628.13	39.01	181.01	7421.26	4344.15
Adjustments								
Supply	2.01	9.33	382.38	223.83	0.52	2.41	98.92	57.91
Surcharge	1.08	5.01	205.46	120.27		0.00	0.00	0.00
FECA		0.00	0.00	0.00		0.00	0.00	0.00
Base Support Costs			0.00	0.00	3.30	15.31	627.79	367.49
Total Adjustments	3.09	14.34	587.84	344.10	3.82	17.72	726.72	425.40
IF Comparability Costs	47.45	220.17	9026.89	5284.03	35.19	163.28	6694.55	3918.76

USAF Cost Savings FY91 -2332.34
USAF Cost Savings FY92 -1365.27

Comparability/Bid Proposal Worksheet

Weapon M1 Rifle
Fiscal Yr 91
Quantity FY91 76
FY92 0

Service		Army				USAF		
Hours per unit		4.10				4.10		
Cost per	Hour	Unit	Project FY91	Project FY92	Hour	Unit	Project FY91	Project FY92
Cost Category								
Direct Labor	18.50	75.85	5764.60	0.00	17.80	72.98	5546.48	0.00
Direct Material	0.24	0.98	74.78	0.00	0.24	0.98	74.78	0.00
Other Direct	3.09	12.67	962.84	0.00	0.98	4.02	305.37	0.00
Production Overhead & G&A	23.13	94.83	7207.31	0.00	21.95	90.00	6839.62	0.00
Total IF Cost	44.96	184.34	14009.54	0.00	40.97	167.98	12766.25	0.00
Adjustments								
Supply	2.01	8.24	626.32	0.00	0.12	0.49	37.39	0.00
Surcharge	1.08	4.43	336.53	0.00		0.00	0.00	0.00
FECA		0.00	0.00	0.00		0.00	0.00	0.00
Base Support Costs			0.00	0.00	3.30	13.53	1028.28	0.00
Total Adjustments	3.09	12.67	962.84	0.00	3.42	14.02	1065.67	0.00
IF Comparability Costs	41.87	171.67	13046.69	0.00	37.55	153.96	11700.58	0.00

USAF Cost Savings FY91 -1346.11
USAF Cost Savings FY92 0.00

ENCLOSURE (4c)

Comparability/Bid Proposal Worksheet

Weapon ANM .50 cal MG
Fiscal Yr 91
Quantity FY91 97
FY92 28

Service		Army				USAF		
Hours per unit		9.10				9.10		
Cost per	Hour	Unit	Project FY91	Project FY92	Hour	Unit	Project FY91	Project FY92
Cost Category								
Direct Labor	18.50	168.35	16329.95	4713.80	15.93	144.96	14061.41	4058.96
Direct Material	13.40	121.94	11828.18	3414.32	13.41	122.03	11837.01	3416.87
Other Direct	3.09	28.12	2727.54	787.33	0.00	0.00	0.00	0.00
Production Overhead & G&A	23.13	210.48	20416.85	5893.52	23.74	216.03	20955.30	6048.95
Total IF Cost	58.12	528.89	51302.52	14808.98	53.08	483.03	46853.72	13524.78
Adjustments								
Supply	2.01	18.29	1774.23	512.15	1.21	11.01	1068.07	308.31
Surcharge	1.08	9.83	953.32	275.18		0.00	0.00	0.00
FECA		0.00	0.00	0.00		0.00	0.00	0.00
Base Support Costs			0.00	0.00	3.30	30.03	2912.91	840.84
Total Adjustments	3.09	28.12	2727.54	787.33	4.51	41.04	3980.98	1149.15
IF Comparability Costs	55.03	500.77	48574.98	14021.64	48.57	441.99	42872.74	12375.64

USAF Cost Savings FY91 -5702.24
USAF Cost Savings FY92 -1646.01

ENCLOSURE (4c

Comparability/Bid Proposal Worksheet

Weapon	M203	
Fiscal Yr	91	
Quantity	FY91	10
	FY92	24

Service		Army				USAF		
Hours per unit		3.00				3.00		
Cost per	Hour	Unit	Project FY91	Project FY92	Hour	Unit	Project FY91	Project FY92
Cost Category								
Direct Labor	18.50	55.50	555.00	1332.00	15.33	45.99	459.90	1103.76
Direct Material	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Direct	3.09	9.27	92.70	222.48	0.00	0.00	0.00	0.00
Production Overhead & G&A	23.13	69.39	693.90	1665.36	16.33	48.99	489.90	1175.76
Total IF Cost	44.72	134.16	1341.60	3219.84	31.66	94.98	949.80	2279.52
Adjustments								
Supply	2.01	6.03	60.30	144.72	0.81	2.43	24.30	58.32
Surcharge	1.08	3.24	32.40	77.76		0.00	0.00	0.00
FECA			0.00	0.00		0.00	0.00	0.00
Base Support Costs			0.00	0.00	3.30	9.90	99.00	237.60
Total Adjustments	3.09	9.27	92.70	222.48	4.11	12.33	123.30	295.92
IF Comparability Costs	41.63	124.89	1248.90	2997.36	27.55	82.65	826.50	1983.60

USAF Cost Savings FY91	-422.40
USAF Cost Savings FY92	-1013.76

ENCLOSURE (4e)

WEAPON SYSTEMS MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS			REPAIR PROGRAM				ACTION	SAVINGS DATA						
A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD	G ANNUAL BUSINESS BASE	H CONS, I/S P/PC	I PROJECTED SAVINGS						
								SERVICE	91	92	93	94	95	TOTAL
								1. COST OF ACTION						
									0	-0.0020	-0.0020	-0.0020	-0.0020	-0.0080
								2. GROSS SAVINGS						
M16	A,N,F,M	NC	200	FH	1.0480	0.0528	CONS, I/S	A	0	0.0191	0.0191	0.0191	0.0191	0.0764
M203	A,N,F,M	NC	24	FH	0.0720	0.0020	CONS, I/S	A	0	-0.0010	-0.0010	-0.0010	-0.0010	-0.0040
MI	A,N,F	NC	0	FH	0.0000	0.0000	CONS, I/S	A	0	0.0000	0.0000	0.0000	0.0000	0.0000
GUU-5P	F	NC	24	FH	0.1110	0.0039	CONS, I/S	A	0	-0.0014	-0.0014	-0.0014	-0.0014	-0.0056
ANM .50 CAL	F	NC	28	FH	0.2540	0.0124	CONS, I/S	A	0	-0.0017	-0.0017	-0.0017	-0.0017	-0.0068
PRIOR TOTAL					1.4850	0.0711			0	0.0150	0.0150	0.0150	0.0150	0.0600
								3. NET SAVINGS						
NEW TOTAL				AI	1.4850	0.0559			0	0.0170	0.0170	0.0170	0.0170	0.0680

WORKLOAD AND CAPACITY DATA

J SOR	K WORKLOAD CHANGE					L CAPACITY CHANGE					
	91	92	93	94	95		91	92	93	94	95
FH	0	-1.485	-1.485	-1.485	-1.485		0	0	0	0	0
AI	0	1.485	1.485	1.485	1.485		0	0	0	0	0

ENCLOSURE (5)

WEAPON SYSTEM MATRIX

FIELD	EXPLANATION
A	INCLUDES ALL USAF SMALL ARMS WORKLOAD
B	SELF EXPLANATORY
C	DETERMINED NON-CORE
D	SELF EXPLANATORY (IN NUMBER OF UNITS)
E	HILL AFB (FH) IS CURRENT SOR
F	1485 M/H IS CURRENT WORKLOAD
G	BASED ON ENCLOSURES (4A-4E)
H	CONSOLIDATION IN FY92
I	COST OF ACTION-Transportation cost savings GROSS SAVINGS-Savings to Air Force NET SAVINGS-Self Explanatory
J	SELF EXPLANATORY
K	WORKLOAD CHANGE TO RESPECTIVE DEPOTS
L	STATISTICALLY INSIGNIFICANT CAPACITY CHANGE

Small Arms Study Group
Tad Costs

MEMBER	PAYGRADE	SERVICE	TRAVEL	LABOR (HRS)
COL J. A. WILSON	O-6	USMC	3500.16	400.00
LTCOL A. C. AKSTIN	O-5	USMC	3532.00	200.00
1LT T. R. NOONAN	O-2	USMC	3204.60	700.00
MR. G. A. BETOURNAY	WS-15	USAF	2650.00	130.00
MR. R. E. BROWN	GM-15	NAVY	3174.25	232.00
MR. G. A. DORNICK	GM-13	NAVY	949.00	40.00
MR. J. C. FUQUA*	GM-14	ARMY	3604.00	280.00
MR. D. W. MAYCROFT	GS-12	USAF	3941.60	168.00
MR. R. T. STEWART**	WS-18	ARMY	5587.50	370.00
MR. L. M. WALTZ	GM-15	NAVY	1834.00	124.50
TOTAL			31977.11	2644.50

GRAND TOTAL $31,977.11

*Includes administrative support
**Includes administrative support and additional person on one trip

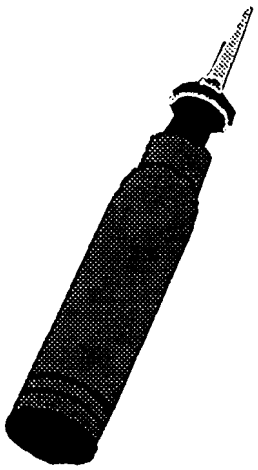
Roster of Participants

NAME	SERVICE	COMMAND	PHONE
COL J. A. Wilson	USMC	DMA, MCLB Barstow, CA	282-7225
LTCOL A. C. Akstin	USMC	HQMC, LPP Washington, DC	226-1079
1LT T. R. Noonan	USMC	DMA, MCLB Barstow, CA	282-7419
Mr. G. A. Betournay	USAF	Hill AFB Ogden, UT	458-7964
Mr. R. E. Brown	USN	NAVSEASYSCOM Washington, DC	332-6780
Mr. G. A. Dornick	USA	NWSC Crane, IN	482-3190
Mr. J. C. Fuqua	USA	AMCCOM Rock Island, IL	793-2759
Mr. D. W. Maycroft	USAF	Warner-Robins ALC Robins AFG, GA	468-9858
Mr. R. T. Stewart	USA	ANAD Anniston, AL	571-6544
Mr. L. M. Waltz	USN	NWSC Crane, IN	482-1211

DEFENSE DEPOT MAINTENANCE COUNCIL

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

CONVENTIONAL MUNITIONS DEPOT MAINTENANCE STUDY



PREPARED FOR:

DEFENSE DEPOT MAINTENANCE COUNCIL

31 JANUARY 1991

DEFENSE DEPOT MAINTENANCE COUNCIL

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Conventional Munitions Depot Maintenance Study

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DEFENSE DEPOT MAINTENANCE COUNCIL

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Conventional Munitions Depot Maintenance Study

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EXECUTIVE SUMMARY

Conventional Munitions Depot Maintenance Study

1. Reference :

a. Memorandum, Deputy Secretary of Defense, 30 June 1990, subject: Strengthening Depot Maintenance Activities.

b. Memorandum, Office of the Assistant Secretary of Defense for Production and Logistics, 8 August 1990, subject: Defense Depot Maintenance Council (DDMC) Meeting Minutes, 24 July 1990.

c. Headquarters, U.S. Army Materiel Command (HQ, AMC), Video Enhanced Users System (VENUS) Tasking Televideo conference, 26 July 1990.

2. As references requested, a multi-Service study team has examined existing Department of Defense (DOD) depot maintenance capabilities for conventional munitions. The team has looked for ways to reduce the cost of, or otherwise improve, depot maintenance on conventional munitions through increased interservice workload consolidation, increased utilization of depot capacity, and increased competition. The team has recommended actions to improve depot maintenance, although it has not identified any specific cost savings.

3. It is important to note that conventional munitions were excluded from the Defense Management Review (DMR) process and had not received any advance study on depot maintenance consolidation as the result of any DMR directives. This is due, in large, to the fact that conventional munitions depot maintenance, in addition to many other functional areas concerning conventional munitions, has been consolidated under the Department of the Army, as the Single Manager for Conventional Ammunition (SMCA), since 1 October 1977. The U.S. Army Armament, Munitions and Chemical Command (AMCCOM) is the primary SMCA field operating agency.

4. Establishment of a multi-Service study group presented no problems. Under the Joint Ordnance Commanders Group (JOCG), functional subgroups have been established to discuss problems concerning interservicing in the Ordnance community and establish policy for mutual understanding and cooperation. In the depot maintenance arena, the Joint Ordnance Commanders Munitions Maintenance Subgroup (JOCMMSG) serves that purpose. It was to the JOCMMSG that the Army turned to invite other Military Service participants.

5. Since the SMCA now conducts all continental United States depot level conventional munitions maintenance, there was no further Military Service consolidation to be gained. The vast majority of all conventional munitions maintenance since 1 October 1977 has been conducted at 12 U.S. Army Depot System Command (DESCOM) depots and depot activities, and 3 AMCCOM activities. The Base Closure and Realignment Act ordered the closure or realignment of 4

DESCOM depot activities at Fort Wingate, Navajo, Pueblo, and Umatilla, thereby reducing the ammunition earth-covered storage space by 34 percent. Ammunition operations organizations at the 8 remaining DESCOM activities, as well as the AMCCOM activities, have been further impacted by the reductions-in-force announced 8 August 1990.

6. Competition of munitions maintenance workload is currently based upon a cost benefit analysis which selects the maintenance performing activity, public or private sector, providing the least overall cost, on schedule, and within the needed quality. This competition effort is a multi-Service effort under the Integrated Conventional Ammunition Maintenance Plan (ICAMP).

7. Since conventional munitions maintenance is primarily a support function of the ammunition receipt, storage and issue mission, and conventional munitions require special storage, transportation, and handling, based upon the analysis that follows, the Conventional Munitions Study Group is unable to recommend further depot maintenance consolidation.

8. Due to savings already achieved by the creation of the SMCA, the relatively limited size of the total conventional munitions depot maintenance budget, and the savings that will continue to accrue as a result of SMCA operations, the Conventional Munitions Depot Maintenance Study Group recommends that this commodity be removed from further DDMC study efforts. The team further recommends that the SMCA continue to workload wholesale storage activities with conventional munitions items determined through the ICAMP to be most efficient and least costly without compromising quality. In addition, the team recommends that the JOCMMSG investigate the potential of certain wholesale storage activities as technical centers of excellence for maintenance of specified families of conventional munitions.

DEFENSE DEPOT MAINTENANCE COUNCIL

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Conventional Munitions Depot Maintenance Study

Membership and Concurrence

Personnel listed below participated in the collection of data, analysis, and development of recommendations for this study effort. Their signatures indicate concurrence with this study group report.

DAVID V. SCHARDEIN
U.S. Army Armament, Munitions and Chemical Command Representative and Conventional Munitions Study Group Leader

BRUCE W. ANGUS
U.S. Army Armament, Munitions and Chemical Command and Study Group Leader's Designated Representative

DEL TUCKER
U.S. Army Depot System Command Representative

JOHN W. NIEHAUS
Naval Sea Systems Command Representative

RICHARD ELDRIDGE
Naval Air Systems Command Representative

DONALD C. RUMBLE, JR.
U.S. Marine Corps Representative

RAMONA J. ALLISON
U.S. Air Force Representative

DEFENSE DEPOT MAINTENANCE COUNCIL

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Conventional Munitions Depot Maintenance Study

1. Study Methodology:

a. Scope: This study analyzes DOD depot maintenance capacity and workload for conventional munitions and associated peculiar end items used by the Army, Navy, Air Force, and Marine Corps. It examines ways to improve depot maintenance on these munitions over fiscal years (FY) 1991 through 1995 through increased interservice workload consolidation, increased utilization of depot capacity, and increased competition. Although the team that prepared this study has identified no cost savings, it has recommended several actions to improve maintenance on conventional munitions.

b. Concept of Current Operations:

(1) The thrust of the Deputy Secretary of Defense's 30 June 1990 memorandum is the consolidation of depot maintenance activities to achieve maximum efficiency and capacity utilization. The Single Manager for Conventional Ammunition (SMCA) was established by DOD Directive 5160.65 on 26 November 1975, to achieve economies and efficiencies in the conventional ammunition wholesale base. The mission of the SMCA was assigned to the Secretary of the Army. The U.S. Army Armament, Munitions and Chemical Command (AMCCOM) is the primary SMCA field operating agency. Economy, efficiency, and effectiveness were gained through integration of procurement, production, and logistics functions under the SMCA. On 1 October 1977, the SMCA was assigned responsibility in a number of functional areas, including:

- Acquisition
- Configuration Management and Control
- Financial Management
- Inventory Management
- Maintenance/Renovation/Demilitarization/Disposal
- Production Base
- Quality Assurance
- Transportation and Handling
- Wholesale Storage of Field Service Assets

(2) The SMCA has the responsibility of managing and operating a wholesale national maintenance point (NMP), operating or providing direction to Army maintenance activities worldwide, and maintaining and renovating wholesale assets on an interservice basis within the continental United States (CONUS). Depot Maintenance Interservice Support Agreements (DMISAs) are not used or required for conventional munitions maintenance in accordance with DOD 5160.65-M.

(3) To consolidate and streamline depot maintenance planning, the SMCA and the Military Services have developed an Integrated Conventional Ammunition Maintenance Plan (ICAMP). The Military Services submit their ammunition maintenance requirements for the budget year and 4 out-years to the SMCA in January each year. Cost estimates are requested from all installations with a capability to perform the scope of work (SOW) required. Cost estimates are analyzed and consolidation of workload in conjunction with other Military Services are considered, along with the associated transportation costs. Recommendations are made by the SMCA to the Military Services at the annual Quad-Service Maintenance Review. Workload is consolidated, based upon a cost benefit analysis, at the maintenance performing activity providing the least overall cost, on schedule, and with the needed quality.

(4) Conventional munitions are hazardous materials requiring special requirements for safe storage, safe transportation, and safe handling. Because of the hazardous nature of munitions, storage is restricted by the quantity-distance provisions of explosive safety regulations. The cardinal principle to be observed in any location or operation involving explosives, ammunition, severe fire hazards, or toxic materials is to limit the exposure of a minimum number of personnel, for a minimum time, to a minimum amount of the hazardous material consistent with safe and efficient operations. Quantity-distance relationships for specific hazard classes of ammunition and explosives are based upon levels of risk considered acceptable for stipulated exposures. The 4 types of quantity-distance, in descending order of severity; i.e., the most restrictive to the least restrictive, are: Inhabited Building Distance, Public Traffic Route Distance, Intraline Distance, and Magazine Distance. The hazard classification system used by the DOD is based upon the system recommended for international use by the United Nations Organization (UNO) which consists of nine classes for dangerous goods with ammunition and explosives included in UNO "Class 1, Explosives". Ammunition without explosive components which contains toxic chemical agents, and containers of toxic chemical agents in bulk, are included in UNO "Class 6, Poisonous (Toxic) and Infectious Substances". Ammunition and explosive hazard classes are further subdivided into 4 divisions based upon the character and predominance of the associated hazards and potential for causing personnel casualties or property damage, not upon compatibility groupings or intended use. Hazard Class and Division Designators and their associated hazards are:

1.1 - Mass-detonating	1.2 - Nonmass-detonating Fragment Producing
1.3 - Mass-fire	1.4 - Moderate fire, no blast

Additionally, fragment distance category numbers are used for some items of class 1, divisions 1, 2, and 3, based upon the range to which a hazardous fragment density may be created by an explosion of the particular item involved. Fragment distances do not indicate the maximum range to which fragments may be projected. In addition to hazard classification, ammunition and explosives are further assigned to storage compatibility groups (SCGs).

diagnostic and repair skills and equipment not currently available to the conventional munitions depot maintenance arena. These items more correctly belong to the Tactical Missile Study Group.

(b) Naval (underwater) mines, torpedoes, and depth charges. These items are peculiar to the Navy, are low density in terms of total number of items of a given model, require underwater testing, and generally are disassembled into warhead, guidance and control, propulsion, and electronic/atmospheric type fuzing for "depot" maintenance. Typically the warhead, or explosive section, the SMCA's area of expertise, is not the section requiring maintenance, nor does the SMCA possess the skills or facilities to perform such maintenance or associated testing.

(c) Nuclear ammunition and included items, such as warheads, warhead sections, projectiles, demolition munitions, and training ammunition. Depot maintenance on nuclear munitions is performed by the owning Service under direction provided by the Department of Energy.

(d) Cartridge-actuated and propellant-actuated devices (CADs and PADs). These items are singly managed for acquisition only by the Naval Ordnance Station, Indian Head, MD. Little or no depot maintenance can be performed on CADs or PADs when their shelf or service lives expire. Some CADs and PADs have been "regrained", but that is a remanufacturing process, not depot level maintenance.

(e) Chaff and chaff dispensers. These items provide an electronic countermeasure (ECM) to enemy homing devices. Due to advancements in ECM technology, little chaff is currently dispensed by ammunition.

(f) Guidance kits for bombs and other ammunition. Like guidance and control sections in guided projectiles, rockets, missiles and submunitions, these guidance kits require electronic diagnostic and repair skills and equipment not currently available to the conventional munitions depot maintenance arena. These kits are not assembled to the explosive portion of the bomb or ammunition item until build-up just prior to hanging on aircraft by organizational level units. The SMCA's area of expertise is in depot maintenance of explosive filled end items and components. In addition, the Tactical Missile Study Group indicated to this team's Air Force member that their study would review these items.

(g) Swimmer weapons. These items are peculiar to the Navy's Sea/Air/Land (SEAL) teams and like Naval mines, torpedoes, and depth charges, are low in density in terms of a given model, require underwater testing, and typically require maintenance outside the SMCA's area of expertise or facilities.

(3) Systems not currently fielded are not included.

(4) Geographical Area of Consideration:

(a) The geographical area of consideration was the continental U.S. (CONUS) only. Depot level maintenance conducted overseas in theaters of operations by the theater commanders of each Military Service was not considered.

(b) The U.S. Army Armament, Munitions and Chemical Command (AMCCOM) budgets and provides funding for outside CONUS (OCONUS) Army ammunition maintenance operations. Army ammunition maintenance being performed in the Republic of Korea and Japan is currently at maximum capacity utilization. The performance of maintenance on other than U.S. Army owned ammunition is presently precluded by the Single Ammunition Logistics System - Korea (SALS-K) agreement.

(c) The Ogden Air Logistics Center (OO-ALC) budgets and provides funding for OCONUS Air Force ammunition maintenance operations. Air Force munitions maintenance performed overseas is intermediate level maintenance at best. Munitions requiring depot level maintenance are returned to CONUS.

(5) Funding will be available for proposed consolidations.

(6) Skilled personnel will be available.

(7) Ammunition peculiar equipment and/or industrial plant equipment (IPE) will be transferred with any associated workload consolidation.

(8) Maximum capacity is defined in terms of direct man-hours (1,615 hours/person/year X 0.95 = 1,534.25) that are calculated based upon the maximum number of direct labor personnel that can effectively work in a single shift, 40 hour week (1-8-5 or 1-10-4).

(9) The Defense Business Operations Fund (DBOF) cost methodology was not used in this study.

d. Study Group Members:

The multi-Service Conventional Munitions Study Group was formed from the principal members of the Joint Ordnance Commanders Munitions Maintenance Subgroup (JOCMMSG). Individual members are listed below.

SERVICE/NAME	ASSIGN-MENT	ORGANI-ATION	OFFICE SYMBOL/CODE	TELEPHONE NUMBERS (DSN) VOICE	FAX
ARMY					
David V. Schardein	Leader	HQ, AMCCOM	AMSMC-DSM	793-5273	793-3452
Bruce W. Angus	Alt Leader	HQ, AMCCOM	AMSMC-DSM-MA	793-4704	793-3452
Del Tucker	Member	HQ, DESCOM	AMSDS-SA-A	570-9203	570-9325

Study Group Members - Continued

SERVICE/NAME	ASSIGN-MENT	ORGANI-ATION	OFFICE SYMBOL/CODE	TELEPHONE NUMBERS (DSN) VOICE	FAX
NAVAL SEA SYSTEMS COMMAND					
John W. Niehaus	Member	NWSCC	PM411	482-3987	482-1883
Forrest C. Lynch	Member	NWSCC	50221	482-1821	482-1883
NAVAL AIR SYSTEMS COMMAND					
*Richard Eldridge	Member	HQ, NAVAIR	AIR-418C	222-0992	~~222-~~1506 222 8521
Jackie W. Puckett	Member	NWSCC	504	482-1020	482-1711
MARINE CORPS					
Donald C. Rumble, Jr.	Member	NWSCC	5033	482-3932	482-3522
*1st Lt J. W. Graves	Member	MCRDAC	AM	226-1160	226-1171
AIR FORCE					
Ramona J. Allison	Member	OO-ALC	LIW	458-5432	458-9484

NOTE: First study group member listed for each Service organization is the principal member. Members noted with an asterisk (*) were not in attendance at the 29 - 30 August 1990 study group meeting held at Naval Weapons Support Center - Crane, IN.

Organizational Legend:

HQ, AMCCOM - U.S. Army Armament, Munitions & Chemical Command, Rock Island, IL
HQ, DESCOM - U.S. Army Depot System Command, Chambersburg, PA
NWSCC - Naval Weapons Support Center - Crane, IN
HQ, NAVAIR - Naval Air Systems Command, Washington, DC
MCRDAC - U.S. Marine Corps Research, Development & Acquisition Command, Washington, DC
OO-ALC - Ogden Air Logistics Center, Hill Air Force Base, UT

e. Site Visits:

(1) Due to the large number of installations performing depot level maintenance on conventional munitions, and limited time allowed for study completion, no site visits were made. All information was obtained by activity completion of a survey (see Appendix A). The following is a list of installations capable of performing depot level maintenance on conventional munitions:

ARMY - HQ, DESCOM - Government Owned - Government Operated (GOGO) - Army Industrial Fund (AIF)

Anniston Army Depot, AL
Letterkenny Army Depot, PA
Savanna Army Depot Activity, IL
Lexington - Blue Grass Army Depot, KY
Red River Army Depot, TX
Seneca Army Depot, NY
Sierra Army Depot, CA
Tooele Army Depot, UT
* Fort Wingate Depot Activity, NM
* Navajo Army Depot Activity, AZ
* Pueblo Army Depot Activity, CO
* Umatilla Army Depot Activity, OR

ARMY - HQ, AMCCOM - Government Owned - Contractor Operated (GOCO) - LAP

Hawthorne Army Ammunition Plant, NV
Iowa Army Ammunition Plant, IA
**Kansas Army Ammunition Plant, KS
**Lone Star Army Ammunition Plant, TX
**Longhorn Army Ammunition Plant, TX
**Louisiana Army Ammunition Plant, LA
Milan Army Ammunition Plant, TN

ARMY - HQ, AMCCOM - GOGO - AIF

Crane Army Ammunition Activity, IN
McAlester Army Ammunition Plant, OK
Pine Bluff Arsenal, AR

FACILITIES NOT CONSIDERED IN STUDY

**Indiana Army Ammunition Plant, IN
**Mississippi Army Ammunition Plant, MS

* Identified for closure under the Base Realignment and Closure Act (BRCA).
** Identified in January 1990 by the Office of the Secretary of Defense for inactivation.

NAVAL WEAPONS STATIONS

Naval Weapons Station, Earle, NJ
Naval Weapons Station, Yorktown, VA
Naval Weapons Station, Charleston, SC
Naval Weapons Station, Seal Beach, CA
Naval Weapons Station, Concord, CA
Naval Weapons Station, Keyport, WA

The following information was provided to the team from the Director of Combat Systems Field Operations and Ordnance Support Group, Code SEA-06G, Headquarters, Naval Sea Systems Command. The primary mission of Naval Weapons Stations is retail conventional ordnance management. In carrying out this mission, Naval Weapons Stations are involved in the receipt, segregation, storage, and issue of non-nuclear, expendable ordnance. The principal customers of the Naval Weapons Stations are the fleet, fleet shore activities, and other shore stations that are not allocated ordnance. With respect to SMCA assigned items, the Naval Weapons Stations do not generally conduct depot level maintenance. Minor cosmetic (intermediate level) maintenance is performed at these sites on condition code "E" stocks since it has been shown by analysis to be the most effective approach. As specified in DOD 5160.55-M, a major (depot level) maintenance requirement with condition code "F" stock is generally transferred to Army conventional munitions depot maintenance activities. Naval Weapons Stations are considered by the Navy as retail receipt and issue points (intermediate/organizational level). (These stations

are analogous to ammunition supply points or bomb dumps which support Army, Air Force, or Marine Corps combat units). As such, Naval Weapons Stations should not be included in any review of depot maintenance consolidation.

AIR FORCE and MARINE CORPS INSTALLATIONS

There are no Air Force or Marine Corps Activities in CONUS that perform depot level conventional munitions maintenance.

(2) The multi-Service study group convened at the Naval Weapons Support Center, Crane, Indiana, on 29 - 30 August 1990 to finalize the essential elements of analysis for this study. In addition, data collection efforts were agreed to, taskings made, and milestones established. Initial draft of study report was distributed 10 September 1990. Concurrence with draft and/or changes were received from the study group members 17 September 1990. Final study report contains only minor format and content changes.

f. Data Collection: A memorandum with enclosure similar to that found in Appendix A was forwarded to each HQ, AMCCOM and HQ, DESCOM subordinate activity for completion. Due to the time compression for study completion and subsequent suspense placed on the reporting activities, replies varied extremely in terms of quality and thoroughness.

2. Analysis:

a. Introduction:

(1) The following sources of information were utilized:

(a) DOD 5160.65-M, Single Manager for Conventional Ammunition (Implementing Joint Conventional Ammunition Procedures), April 1989.

(b) Conventional Ammunition Maintenance Management, Logistics Systems Analysis Office, September 1983.

(c) AR 700-20, Ammunition Peculiar Equipment (APE), 5 February 1990.

(d) AMC Regulation 385-100, Safety Manual, 1 August 1985.

(e) Joint Ordnance Commanders Group, Storage Manager's Handbook, 55th Edition Compiled by HQ, AMCCOM, AMSMC-DSC-L, 31 March 1990.

(f) Integrated Conventional Ammunition Maintenance Plan, FY 91 - FY 95, 1 September 1990, Revised.

(g) Ammunition Maintenance Capability Survey (Appendix A).

(2) The analysis includes a categorization of conventional munitions, maintenance and support facilities, skills, technical support, environmental considerations.

b. Categorizations:

(1) There are multiple ways to categorize ammunition.

(a) Federal Supply Classes:

SMCA ASSIGNED CLASSES

1305 - Ammunition, through 30mm. Includes components.

1310 - Ammunition, over 30mm up to 75mm. Includes components, except fuzes and primers; chemical warfare cartridges. Excludes fuzes and primers.

1315 - Ammunition, over 75mm up to 125mm. Includes components, except fuzes and primers; pyrotechnic cartridges and projectiles; chemical warfare cartridges and projectiles. Excludes fuzes and primers.

1320 - Ammunition, over 125mm. Includes components, except fuzes and primers; chemical warfare projectiles. Excludes fuzes and primers.

1325 - Bombs. Includes components; photoflash bombs; chemical warfare bombs; cluster bombs.

1330 - Grenades. Includes components; hand and rifle grenades; smoke grenades. Excludes firing devices (launchers).

1340 - Rockets, Rocket Ammunition and Rocket Components. Includes complete rounds; explosive components, including warheads; pyrotechnic rockets; solid fuel Jet Assist takeoff (JATO) units; rocket motors (solid propellant units) for rockets; protective covers for rocket warheads; jettisonable rocket launchers; controlled environment conditioning kits and sets; and other components which are not classified elsewhere. Excludes nuclear rockets, nuclear warheads; all other warheads for use on other than rockets; and rockets with built-in guiding devices (guided missiles).

1345 - Land Mines. Includes components; antipersonnel mines; antitank mines; fuzes.

1365 - Military Chemical Agents. Includes war gases; screening smokes; incendiary and thickening agents; signaling smokes. Excludes ammunition containing military chemical agents.

1370 - Pyrotechnics. Includes flares; signals; fireworks; pistol rocket signals. Excludes pyrotechnic cartridges and projectiles; photoflash bombs; pyrotechnic rockets.

SMCA ASSIGNED CLASSES - CONTINUED

1375 - Demolition material. Includes items for construction, quarrying and demolition work such as dynamite and other explosives packed in cylindrical paper containers or in bags; demolition charges; blasting caps; blasting time fuse; detonating cord; demolition firing devices; booby trap mechanisms; bangalore torpedoes; inert accessories and components such as blasting machines, priming adapters, and detonating cord clips. Excludes liquid propellant fuel and oxidizers; solid propellants encased in consumable containers for insertion into missile propulsion systems as integral parts; guided missile explosive devices; safety-in-flight explosive items and devices such as impulse cartridges, delay cartridges, aircraft ejection seat catapults, aircraft canopy removers, and similar items; solid propellants, predetermined to specific quantity and quality and packaged in reusable containers; nuclear ordnance components; rocket and guided missile motors, warheads, and propulsion sections.

1376 - Bulk explosives. Includes solid propellants, predetermined to specific quantity and quality, packaged in reusable containers; explosive loaded devices and components.

1390 - Fuzes and primers. This FSC includes only fuzes and primers for use in ammunition classified in classes 1310, 1315, and 1320. Excludes fuzes and primers for ammunition not classified in classes 1310, 1315, and 1320.

1395 - Miscellaneous Ammunition. Includes ammunition shapes, such as blanks, disks, slugs, cups, and rotating bands.

NON-SMCA ASSIGNED CLASSES

1336 - Guided Missile Warheads and Explosive Components.

1337 - Guided Missile and Space Vehicle Explosive Propulsion Units, Solid Fuels, and Components.

1338 - Guided Missile and Space Vehicle Inert Propulsion Units, Solid Fuel, and Components.

1350 - Underwater Mine Inert Components.

1351 - Underwater Mine Explosive Components.

1355 - Torpedo Inert Components.

1356 - Torpedo Explosive Components.

1360 - Depth Charge Inert Components.

NON-SMCA ASSIGNED CLASSES - CONTINUED

1361 - Depth Charge Explosive Components.

1377 - Cartridge and Propellant Actuated Devices and Components.

1380 - Military Biological Agents.

1385 - Surface Use Explosive Ordnance Disposal Tools and Equipment.

1386 - Underwater Use Explosive Ordnance Disposal Tools and Equipment.

1398 - Specialized Ammunition Handling and Servicing Equipment.

(b) Conventional munition items identified as Non-SMCA items were not included in this study based on the following rationale:

(1) Items are unique to the owning Service; therefore, these items were not candidates for consolidation.

(2) Depot level maintenance is performed by owning Service only and not duplicated within the SMCA base.

(3) Depot level maintenance expertise or facilities required to perform maintenance on these items are not currently available within the SMCA depot maintenance arena.

(c) Department of Defense Identification Codes (DODICs) are used by ammunition end item user. A DODIC is required for all items of supply within federal supply group 13 except repair parts and industrial components. Usually comprised of 1 alpha and 3 numeric characters or 2 alpha and 2 numeric characters. Typical DODIC prefixes by FSC:

1305 - A___	1330 - G___	1375 - M___
1310 - B___	- H___	1376 - NONE
1315 - C___	1340 - H___	1377 - M___
1320 - D___	- J___	1390 - N___
1325 - E___	1345 - K___	1395 - NONE
- F___	1365 - K___	
- G___		

(d) Integrated Conventional Ammunition Maintenance Plan (ICAMP) families:

Family I - Small Arms through 20mm
Family II - 25mm/30mm/40mm/64mm
Family III - Mortar
Family IV - Artillery and Navy Gun
Family V - Tank (Main Gun)

Family VI - Bombs
Family VII - Grenades
Family VIII - Rockets
Family IX - Mines
Family X - Pyrotechnics
Family XI - Demolition Material
Family XII - Miscellaneous

c. Workload Analysis:

(1) Based upon a dynamic system currently in operation; i.e., ICAMP, cost/benefit analyses are conducted to consolidate workload at a maintenance performing activity providing the least overall cost, on schedule, and within the needed quality. Prior to FY 91 there were 15 SMCA activities that routinely performed conventional munitions maintenance. As a result of the BRCA, ammunition major maintenance is now planned for the 11 remaining CONUS depots/activities. Workload for those activities is shown in short on the charts in Appendix B. Each of the principal installations have other missions and their capabilities and capacities for munitions maintenance may vary. Pursuant to base closure and realignment, Fort Wingate, Navajo and Pueblo Army Depot Activities have no identified maintenance workload. However, Umatilla Army Depot Activity has forecasted TCM maintenance workload.

(2) The individual charts depicting planned munitions maintenance by depot/activity are designed to show maintenance workload fluctuation within each activity only for FY 91 and FY 92 only. Final workloading decisions concerning actual maintenance performing activity for FY 93 through FY 95 will not be made until the fiscal year immediately prior to fiscal year of execution. Gross projections by Service in dollars and tons forecasted for FY 91 through FY 95 follow individual depot/activity tabulated data in bar/pie chart form. Due to a lack of Army funding for minor maintenance, which the Army is to provide on all Military Service stocks stored at SMCA installations, no minor maintenance programs are planned for FY 91 and FY 92.

(3) Planned maintenance for FY 91 and FY 92 by individual depot/activity, Department of Defense Identification Code (DODIC), customer, quantity, available assets as of 1 May 1990, is merged into Appendix B. Maintenance workloading for 12 AMCCOM and DESCOM installations, a single summary of other GOCO and COCO activities, plus forecasted generation tonnage (not allocated), is shown in Appendix B. Installations and their abbreviations are as follows:

Crane Army Ammunition Activity (CAAA)
Hawthorne Army Ammunition Plant (HWAAP)
McAlester Army Ammunition Plant (MCAAP)
Anniston Army Depot (ANAD)
Lexington - Blue Grass Army Depot (LBAD)

Letterkenny Army Depot (LEAD)
  Savanna Army Depot Activity (SVDA)
Red River Army Depot (RRAD)
Seneca Army Depot (SEAD)
Sierra Army Depot (SIAD)
Tooele Army Depot (TEAD)
  Umatilla Army Depot Activity (UMDA)
Allocated at Other Plants and Contractors
  Iowa Army Ammunition Plant (IAAP)
  Kansas Army Ammunition Plant (KAAP)
  Louisiana Army Ammunition Plant (LAAP)
  Milan Army Ammunition Plant (MAAP)
Not Allocated (XXXX)

d. Maintenance and Support Facilities:

(1) Overview:

(a) All HQ, AMCCOM and HQ, DESCOM depots/activities/plants have facilities which can be made suitable for performance of maintenance on the current inventory of SMCA items. That statement assumes that the required Ammunition Peculiar Equipment (APE), repair parts, technical data packages, unserviceable assets, and related resources are available.

(b) Maintenance on Navy peculiar ammunition, such as 3-Inch/50 Caliber, 76mm/62 Caliber, 5-Inch/38 Caliber, 5-Inch/54 Caliber, and 16-Inch/50 Caliber Naval gun ammunition, is primarily performed at Crane Army Ammunition Activity, Hawthorne and McAlester Army Ammunition Plants. These AMCCOM activities were Naval Ammunition Depots (NADs) prior to 1 October 1977 when they were reassigned to the SMCA. Unlike the Army concept of a depot, NADs not only performed a depot operation mission, but also served as the load, assemble and pack (LAP) facilities for the same ammunition. The majority of the special equipment required for maintenance and unserviceable Navy assets have been and continue to be stored at these locations. Additional sites can and will be developed if cost benefit analyses indicate performance improvements justify the requirement.

(c) One significant area unique to munitions is the maintenance facility requirements to support our Toxic Chemical Munitions (TCM) major maintenance programs. Five prime DESCOM installations have been assigned the maintenance mission of the TCM wholesale stockpile for all Military Services. They are Anniston, Lexington-Blue Grass, and Tooele Army Depots, and Pueblo and Umatilla Army Depot Activities. Pueblo and Umatilla will still support TCM under the Base Realignment and Closure Act Implementation Plan. It is important to note that TCM movement from one installation to another over public traffic routes requires an act of Congress or an Executive Order based upon a national security requirement. Furthermore, the TCM stockpile

demilitarization currently under negotiation with the Soviet Union will be performed at the installations where the materiel is stored; i.e., it will not be consolidated at one or two locations for disposal.

(d) Analysis of TCM maintenance facilities that conform to all safety, security, and surety requirements are as follows:

(1) At present, the Anniston chemical maintenance facility is a structure that was originally constructed for use as a cafeteria and was renovated/modified during the 1950s for use as a conventional munitions operating facility. Further modification was accomplished in 1978 to make the facility conform to all known TCM maintenance requirements. This facility meets TCM maintenance requirements for the current inventory. A new TCM facility is currently in the Military Construction - Army (MCA) program at DESCOM and AMCCOM to meet future TCM needs.

(2) A TCM maintenance facility was constructed at Lexington - Blue Grass Army Depot and made operational during October 1984.

(3) At present, the Tooele chemical maintenance facility is a structure that is a modified conventional ammunition maintenance facility which does not meet TCM maintenance requirements for the current inventory.

(4) A new TCM maintenance facility at Umatilla Army Depot Activity became operational in March 1984. This facility will continue in accordance with base realignment and closure concept/procedures.

(e) The conventional ammunition maintenance buildings in use were built in the 1940s and 1950s. During the last 40 years many changes have occurred which relate to structural materials, construction techniques, industrial automation and changes or improvements in conventional munitions. There are no munitions maintenance performing activities with maintenance facilities clearly superior to the others.

(f) Previous assessments relative to ammunition facilities and their adequacy to meet requirements imposed by modern munitions determined that the present maintenance facilities are adequate for support for the current inventory, but will not be adequate for future use in support of modern munitions. The age of most ammunition maintenance facilities causes concern about the remaining useful life of these facilities.

(2) Status on Base Realignment and Closure:

(a) Base Realignment and Closure Commission report became federal law as the Base Realignment and Closure Act (BRCA) on 29 April 1989 with implementation beginning 1 January 1990. In order to facilitate the provisions of BRCA, maintenance missions will be consolidated at number of installations. This consolidation will result in an overall improvement of Defense Department operations.

(b) The following is a brief synopsis of SMCA facilities that will be affected by base realignment and closure:

(1) Fort Wingate Army Depot Activity will be closed with ammunition mission moved to Hawthorne Army Ammunition Plant (HWAAP).

(2) Navajo Army Depot Activity will be closed with ammunition mission moved to HWAAP.

(3) Pueblo Army Depot Activity will be realigned with the general supply mission moved to Tooele Army Depot and the ammunition mission moved to Red River Army Depot. The TCM mission will remain until such time as that stockpile is disposed.

(4) Umatilla Army Depot Activity will be realigned with ammunition mission moved to HWAAP. The TCM mission will remain until such time as that stockpile is disposed.

(3) Ammunition Activity Capabilities/Capacities appear in Appendix C. Facts pertaining to storage capacities, shipping, and receiving on the charts in Appendix C were taken from the 55th Edition of the Joint Ordnance Commanders Group Storage Manager's Handbook, 31 March 1990, compiled by HQ, AMCCOM, AMSMC-DSC-L.

e. Skills:

(1) Repair skills mix charts appear in Appendix D.

(2) Test/support equipment for conventional munitions is known as APE.

(a) An additional mission of the SMCA is the Ammunition Peculiar Equipment (APE) program. Equipment is classified as either APE or nonstandard APE. Ammunition Peculiar Equipment is defined as those items and systems designed, made, tested, procured, and approved as standard equipment for ammunition depot operation. Nonstandard APE is defined as special tools, fixtures, jigs designed and made locally by users for use in ammunition operations.

(b) The objectives of the APE program are as follows:

(1) To provide a central source of standard, modern, safe, reliable, and environmentally acceptable equipment for ammunition operations.

(2) To prevent damage to ammunition or related facilities as well as injury to personnel as a result of unauthorized or improper design, use, or modification.

(c) As the SMCA field operating agency, HQ, AMCCOM, performs the following:

(1) Centrally manages and executes the APE program.

(2) Compiles APE needs and rates, and develops economic program analyses.

(3) Establishes and maintains a 5-year program including budget needs and proposed distribution of equipment.

(4) Assures that inspections and inventories are made as necessary, and establishes records of the status and location of all equipment worldwide.

(5) Controls technical design, testing, documentation, and modification, and provides final approval for all APE items.

(6) Keeps accounts for all APE items loaned to the U.S. Army and other Military Service users.

(7) Directs the disposition of APE that has been declared excess to Army requirements or that is not economically reparable.

(8) Assures the existence of safety approval prior to issue and field use of APE items.

(9) Establishes and maintains a modification work order program for APE.

(10) Reviews all requests fro approval of locally developed and modified nonstandard APE, obtains engineering and safety approval for items, and assigns identifying numbers to the equipment.

(11) Provides assistance with preinstallation, and trains personnel qualified to be operators.

(d) Although all ammunition depots possess the capability to perform maintenance on the current inventory, each activity is not equipped with every piece of equipment in the APE inventory. This is due to the fact that ammunition maintenance programs are typically great in number and short in duration. In addition, by centrally managing the APE inventory, fewer total pieces of equipment are needed to accomplish the overall mission.

f. Technical Support: Depots have production planning and control organizations within their ammunition operations. The depots rely upon HQ, AMCCOM, for maintenance engineering support for Army configuration managed materiel, OO-ALC for Air Force configuration managed items, and various Navy in-service engineering agencies for Navy configuration managed items. Army ammunition plants have engineering capability as well.

g. Environmental Considerations: Since no munitions maintenance workload is planned for relocation, there are no environmental costs/factors to be considered.

3. Efficiencies and Cost Reductions: Although the conventional munitions study group did not initially identify any savings, the group was tasked at the Army Lead Study Group Conference, 17 - 20 Sep 90, at Chambersburg, PA, to look in the area of ammunition peculiar equipment (APE) and identify any APE that had been improved or fabricated with increased productivity or efficiency in mind. Upon return to HQ, AMCCOM, cost savings previously identified were reviewed in depth by this headquarter's Cost Analysis Directorate, Rock Island Cost Analysis Division, Data Analysis and Validation Branch (AMSMC-CAR-V), and found to be attributable to procurement appropriations, not to the operations and maintenance appropriation. Therefore, those savings were deleted from this report.

4. Conclusions: A detailed review of all Military Services conventional munitions was accomplished. An evaluation was conducted using available information to determine what workload could be consolidated. Based upon workload, facilities, equipment, skills, technical support, environmental considerations, and cost, the following conclusions were drawn:

a. The Single Manager for Conventional Ammunition has been expending much effort since FY 78, 1 October 1977, to increase economies and improve efficiencies in the conventional munitions wholesale base, including munitions maintenance. Workload was consolidated under the Army with the assignment of 3 Naval Ammunition Depots. No other Military Service operates conventional munitions maintenance depots in the continental U.S. It is the Navy's contention and the Single Manager's belief that the Navy coastal activities perform only intermediate level maintenance. Any item requiring depot level maintenance is retrograded to the SMCA. The primary mission of the Naval Weapons Stations is receipt from, issue to, and storage of ammunition for the Fleet; i.e., they perform a function similar to an ammunition supply point or a bomb dump servicing Army, Air Force, and Marine Corps combat units. Performance of depot level maintenance at the Navy coastals would be in violation of the Single Manager for Conventional Ammunition's charter and a divergence from 13 plus years of streamlining/consolidation effort. Therefore, there are no other CONUS locations to consolidate.

b. The Base Realignment and Closure Act will reduce the number of HQ, DESCOM depots with the capability of performing depot level munitions maintenance from 12 to 8. This represents a reduction of the ammunition earth-covered storage space by 34 percent. Army ammunition plant inactivations announced in January 1990 by the Secretary of Defense will reduce from 9 to 6, the number of load, assemble, and pack activities that have been previously utilized to perform depot level munitions maintenance from 9 to 6. The BRCA closures and realignments and the Army ammunition plant inactivations will impact not only those facilities being realigned or closed, but also the installations absorbing the realigned workload. The additional

munitions maintenance workload inherited by these installations is and will continue to be evaluated by the SMCA.

c. The potential retrograde of conventional munitions from Europe and Korea, as the U.S. commitment in those areas of the world diminishes, and from Operation Desert Shield assets in the Persian Gulf, will require adequate CONUS ammunition storage. Since conventional munitions maintenance is a support function to ammunition storage, it would be prudent to maintain the maintenance capability at all SMCA storage activities.

d. The question of contractor versus organic munitions maintenance is weighed in the cost/benefit analysis for each item identified for munitions maintenance under the Integrated Conventional Ammunition Maintenance Plan (ICAMP). Maintenance performed at GOCO Army ammunition plants is performed by contractor personnel. In recent years, munitions maintenance on more modern conventional munitions has been scheduled at the original load, assemble, and pack plant to avoid costly investment in the design and fabrication of APE. In addition to contractor operated Army ammunition plants, commercially owned and operated contractor facilities have been used for the performance of munitions maintenance. These decisions were based upon, and will continue to be based upon, cost/benefit analyses for each item. Continued savings and workload consolidations can be anticipated.

e. The mobile ammunition maintenance team concept was discussed by the study group. The Service with the most experience in this arena is the Navy. Their Mobile Ammunition Evaluation and Reconditioning Unit (MAERU) has met with limited success in the area of depot level maintenance. Any mobile team would require facilities, equipment, and appropriate support personnel to perform munitions maintenance in accordance with explosive safety regulations.

f. Current munitions maintenance facilities are adequate for support of the munitions stockpile today, but may not be adequate for future use in support of modern munitions. The age of most ammunition maintenance facilities causes concern about the remaining useful life of these facilities. Without extensive outlays of MCA funds to replace or build new munitions maintenance facilities, the best course of action is to continue to use and maintain facilities currently available.

g. Ammunition maintenance is a small portion (15 to 30 percent) of the total ammunition mission at any given installation.

h. Activities storing wholesale stocks of conventional munitions must maintain Care of Supplies in Storage (COSIS) (minor maintenance) and munition demilitarization/disposal capability as an integral part of their receipt, storage, and issue function. The same personnel, facilities, and equipment used for maintenance are used for COSIS, and to a lesser extent demilitarization/disposal. Therefore, each activity storing wholesale stocks

of conventional munitions must maintain, at least the basic capability to perform maintenance. The question is, "To what extent should that capability be supported?".

i. It is important to note that the conventional munitions study group has conducted its review strictly from the viewpoint of conventional munitions. The conventional munitions depot maintenance study group was unable to assess the impact of the recommendations made by any other study group concerning the consolidation or closure of a multi-mission depot.

5. Recommendations: A detailed review of all Military Services conventional munitions was accomplished. An evaluation was conducted using available information to determine what workload could be consolidated. Based upon workload, facilities, equipment, skills, technical support, environmental considerations, and cost, the following recommendations are made:

a. The removal of conventional munitions from further Defense Depot Maintenance Council efforts due to savings already achieved by the creation of the Single Manager Conventional Ammunition, the relatively limited size of the total conventional munitions depot maintenance budget, and the savings that will continue to accrue as a result of SMCA operations.

b. The Single Manager for Conventional Ammunition continue to workload wholesale storage activities with items determined through Integrated Conventional Ammunition Maintenance Plan cost/benefit analyses to be most efficient and least costly without compromising product quality.

c. The Joint Ordnance Commanders Munitions Maintenance Subgroup investigate the potential of certain wholesale storage activities as "Technical Centers of Excellence" for maintenance of specified families of ammunition. As Technical Centers of Excellence, each center would maintain operational facilities and would be workloaded to the maximum extent possible. This would require the support of the SMCA national inventory control point, with concurrence from the Service's inventory control points, when retrograding stocks from field/fleet activities to the SMCA.

APPENDIX A - DATA COLLECTION INSTRUMENT
DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND
ROCK ISLAND, ILLINOIS 61299-6000

S: 6 SEPTEMBER 1990

AMSMC-DSM (750-51a) 4 SEPTEMBER 1990

MEMORANDUM FOR: COMMANDER, CRANE ARMY AMMUNITION ACTIVITY,
ATTN: SMCCN-CO, CRANE, IN 47522-5099

SUBJECT: AMMUNITION MAINTENANCE CAPABILITY SURVEY

1. REFERENCE:

A. MEMORANDUM, DEPUTY SECRETARY OF DEFENSE, 30 JUNE 1990, SUBJECT: STRENGTHENING DEPOT MAINTENANCE ACTIVITIES.

B. MESSAGE, HQ, AMC, AMCSM, 242100Z AUG 90, SUBJECT: LEAD SERVICE ASSIGNMENTS.

2. REFERENCE 1A DIRECTED THE ESTABLISHMENT OF THE DEFENSE DEPOT MAINTENANCE COUNCIL (DDMC) TO ADVISE THE ASSISTANT SECRETARY OF DEFENSE FOR PRODUCTION AND LOGISTICS ON DEPOT MAINTENANCE WITHIN THE DEPARTMENT OF DEFENSE. IN ADDITION, IT DIRECTED THE SECRETARIES OF THE MILITARY DEPARTMENTS TO PREPARE AND SUBMIT BY 1 OCTOBER 1990 TO THE ASSISTANT SECRETARY OF DEFENSE FOR PRODUCTION AND LOGISTICS FOR APPROVAL A COORDINATED LONG RANGE PLAN FOR REDUCING THE COST OF DEPOT MAINTENANCE OPERATIONS OF THE MILITARY DEPARTMENTS BY $2.2 BILLION (BETWEEN FY 91 - FY 95), WHILE MAINTAINING THE DEPOT MAINTENANCE INFRASTRUCTURE NECESSARY TO MEET VALID PEACETIME REQUIREMENTS AND CONTINGENCY NEEDS. AT THE FIRST MEETING OF THE DDMC, 24 JULY 1990, 20 COMMODITY GROUPINGS WERE DIVIDED AMONG THE MILITARY SERVICES AND THE DEFENSE LOGISTICS AGENCY. THE ARMY WAS ASSIGNED LEAD SERVICE RESPONSIBILITY FOR CONVENTIONAL MUNITIONS. AT A VENUS VIDEO TELECONFERENCE CONDUCTED BY HQ, AMC AND THE MAJOR SUBORDINATE COMMANDS ON 26 JULY 1990, THIS OFFICE WAS DELEGATED THE RESPONSIBILITY TO FORM A JOINT SERVICE STUDY GROUP TO COLLECT AND ANALYZE DATA AND MAKE RECOMMENDATIONS AS TO HOW CONVENTIONAL MUNITIONS MAINTENANCE CAN CONTRIBUTE TO THE MANDATED LONG RANGE SAVINGS. OUR ORIGINAL ESTIMATED STUDY COMPLETION DATE WAS 15 NOVEMBER 1990. REFERENCE 1B DIRECTED THAT OUR FINAL STUDY BE COMPLETED BY 14 SEPTEMBER 1990.

3. THEREFORE, IT IS IMPERATIVE THAT YOUR INSTALLATION PUT FORTH ITS BEST EFFORT TO PROVIDE THE FOLLOWING INFORMATION TO THIS OFFICE BY NLT COB 6 SEPTEMBER 1990. IT GOES WITHOUT SAYING THAT YOUR EFFORTS WILL HAVE SIGNIFICANT IMPACT ON THE FUTURE MISSION OF YOUR INSTALLATION. THANK YOU IN ADVANCE FOR YOUR ASSISTANCE AND UNDERSTANDING. AS REFERENCE 1B DIRECTED THIS HQ TO

MEET ITS SUSPENSE, YOU MUST MEET YOUR SUSPENSE IN SUPPORT OF OUR EFFORT.

4. REQUEST YOU PROVIDE THIS OFFICE WITH THE FOLLOWING INFORMATION:

A. A COMPLETED COPY OF ENCLOSURE 1 FOR EACH BUILDING USED OR CAPABLE OF BEING USED FOR AMMUNITION MAINTENANCE OR CARE OF SUPPLIES IN STORAGE OPERATIONS.

B. A LIST OF ANY AMMUNITION BUILDINGS OUTLEASED, LOANED, OR OTHERWISE OCCUPIED BY CONTRACTORS, OTHER DIRECTORATES, OR MILITARY SERVICES TO INCLUDE INFORMATION REQUIRED BY PARAGRAPH 4A.

C. A LIST OF ANY SPECIAL PURPOSE BUILDINGS OR EQUIPMENT AVAILABLE FOR AMMUNITION OPERATIONS (X-RAY FACILITY, MISSILE TEST EQUIPMENT, ETC.) WITH A GENERAL EXPLANATION OF THEIR USE.

D. A STATEMENT OF WHAT GROUP OR GROUPS OF MUNITIONS WHICH THE PLANT/ACTIVITY FEELS ARE PARTICULARLY QUALIFIED TO PROCESS, WITH CORRESPONDING JUSTIFICATION.

E. A LISTING OF MAJOR AMMUNITION PECULIAR EQUIPMENT (APE) AND INDUSTRIAL PLANT EQUIPMENT (IPE) ITEMS CURRENTLY AVAILABLE AT YOUR ACTIVITY. THIS DOES NOT INCLUDE CARTS, VISES, KITS, ETC.

F. A STATEMENT OR LISTING OF ANY INFORMATION WHICH YOU FEEL WILL BE OF IMPORTANCE IN THIS EFFORT.

G. NUMBER OF AMMUNITION PERSONNEL ASSIGNED TO CONVENTIONAL AMMUNITION MAINTENANCE BY JOB SERIES, TITLE, AND GRADE LEVEL.

H. YOUR BEST ESTIMATE OF THE NUMBER OF PERSONNEL REQUIRED FOR FULL-TIME OPERATION OF ALL CONVENTIONAL AMMUNITION MAINTENANCE OPERATIONS; I.E., 40 HOUR WEEK (1-8-5 OR 1-10-4, AS APPROPRIATE).

I. ACTIONS TAKEN TO IMPLEMENT TOTAL QUALITY MANAGEMENT INTO CONVENTIONAL AMMUNITION MAINTENANCE OPERATIONS.

5. THE POINT OF CONTACTS FOR THIS REQUEST ARE
MESSRS. DAVE SCHARDEIN OR BRUCE ANGUS, AMSMC-DSM, VOICE DSN 793-5273/4709, DATAFAX DSN 793-4230/4808.

FOR THE COMMANDER:

ENCL
AS

DAVID V. SCHARDEIN
ACTING CHIEF, MAINTENANCE
MANAGEMENT DIVISION

ACTIVITY NAME:

BLDG NUMBER: SQUARE FOOTAGE:

CURRENT USE:

OPTIONAL USE:

NUMBER OF BAYS:

	YES	NO
IS BLDG OPERATIONAL:		

ARE THE FOLLOWING AVAILABLE AND OPERATIONAL?

WATER
ELECTRICITY
HEAT
SPRINKLER SYSTEM
MANUAL DELUGE
RATE OF RISE DELUGE
RAPID RESPONSE DELUGE SYSTEM
POWER CONVEYORS
HOISTS (QTY _____ & _____ WGT LIMIT)
PAINT BOOTHS (QTY _____ & SIZE _____)
DRYING BOOTHS OR ROOMS
CARC PAINTING EQUIPMENT
BREATHABLE AIR FOR PAINTERS
SAND/GRIT/ABRASIVE BLAST EQUIPMENT
POWDER COLLECTION EQUIPMENT
INTRUSION DETECTION SYSTEM
SERVICE MAGAZINES (QTY _____)

BUILDING NET EXPLOSIVE WEIGHT LIMIT:

EXPLAIN ANY RESTRICTIVE ELEMENTS:

EXPLAIN ANY GENERAL CONDITION AND CONSTRUCTION OF BUILDING:

EXPLAIN ANY PLANNED IMPROVEMENTS OR EQUIPMENT INSTALLATION WITH ESTIMATED TIME OF COMPLETION:

CONTINUE ON AN ATTACHED SHEET, IF REQUIRED. ENCLOSURE 1

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR CAAA

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	D255	PROJ 5 IN/38 ILLUM	NAVY	5000	5000	273.00
H	D272	CHG PROP 5 IN/38 FULL	NAVY	12620	12620	830.12
H	D274	CHG PROP 5 IN/38 FULL	NAVY	3711	3711	244.10
M	E488	BOMB MK-82 TP	NAVY	2100	0	488.14
M	E510	BOMB MK-83 TP	NAVY	450	0	104.60
L	H340	RKT MOTOR, JATO MK 6	NAVY	2000	2000	0.00
L	H340	RKT MOTOR, JATO MK 6	NAVY	500	500	155.63
M	K873	SMOKE POT AN-M7 FLOAT	NAVY	10000	10000	430.70
				TOTAL PROGRAM DOLLARS		2526.29

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	C178	CTG 3 IN/50 BL&P RF NFL	NAVY	2100	0	64.09
M	C347	CTG 3 IN/50 HC RF MKS	NAVY	650	0	74.48
L	D280	PROJ 5 IN/38 HE-IR	NAVY	3000	3000	153.33
L	D313	PROJ 5 IN/54 SMK WP	NAVY	500	164	59.06
M	D330	PROJ 5 IN/54 HE-PD	NAVY	3300	528	266.12
H	D333	PROJ 5 IN/54 NF VT-NF	NAVY	750	532	61.34
L	D353	PROJ 5 IN/54 ILLUM	NAVY	800	324	63.02
M	E488	BOMB MK 82 TP	NAVY	2100	0	532.08
				TOTAL PROGRAM DOLLARS		1273.52

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR HWAAP

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	B630	CTG 60MM SMK WP M302	ARMY	6727	6727	230.14
M	B630	CTG 60MM SMK WP M302	USMC	27593	0	441.49
H	B642	CTG 60MM HE COMP B M720	USMC	30000	0	273.48
H	C226	CTG 81MM ILLUM M301	ARMY	7752	7752	124.03
H	C226	CTG 81MM ILLUM M301	USMC	21851	10747	575.46
H	C256	CTG 81MM HE M374 SERIES	ARMY	8933	8933	144.12
H	C256	CTG 81MM HE M374 SERIES	USMC	30000	6384	527.88
M	C276	CTG 81MM SMOKE WP M375	USMC	10299	972	187.46
L	C432	CTG 105MM HE M1 W/FUZE	USAF	43953	0	1506.26
H	D272	CHG PROP 5 IN/38 FULL	NAVY	4074	4074	267.98
H	D274	CHG PROP 5 IN/38 FULL	NAVY	393	393	25.85
L	D544	PROJ 155MM HE	ARMY	87000	87000	1187.52
H	D680	PROJ 8 IN HE M106	USMC	10997	10997	327.95
L	D862	PROJ 16 IN/50 AP	NAVY	600	600	271.37
L	G119	FMU-139A/B	USAF	80000	80000	344.43
L	TEST	LCpl CARTER TEST RANGE OPERATIONS	USMC	9	0	924.92

TOTAL PROGRAM DOLLARS 7360.34

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR HWAAP

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	B630	CTG 60MM SMK WP M302	NAVY	1147	0	21.47
H	B630	CTG 60MM SMK WP M302	USMC	7000	0	131.04
M	B630	CTG 60MM SMK WP M302	USMC	912	0	17.07
L	B632	CTG 60MM HE M49 SERIES	NAVY	1553	0	23.67
H	B632	CTG 60MM HE M49 SERIES	USMC	35000	0	533.40
M	B642	CTG 60MM HE COMP B M720	ARMY	1558	1558	37.06
H	C226	CTG 81MM ILLUM M301	ARMY	14691	14691	235.06
M	C226	CTG 81MM ILLUM M301	USMC	17319	0	474.02
H	C256	CTG 81MM HE M374 SERIES	ARMY	7601	7601	124.12
M	C256	CTG 81MM HE M374 SERIES	NAVY	38154	761	695.55
M	C256	CTG 81MM HE M374 SERIES	USMC	124164	0	2263.51
M	C276	CTG 81MM SMOKE WP M375	NAVY	2000	1606	44.46
M	C276	CTG 81MM SMOKE WP M375	USMC	156	0	3.34
L	C432	CTG 105MM HE M1 W/FUZE	USAF	43953	0	1579.63
M	C697	CTG 4.2 IN HE	ARMY	10000	10000	202.60
H	D680	PROJ 8 IN HE M106	USMC	104	0	2.49
H	D680	PROJ 8 IN HE M106	USMC	3051	0	72.95
L	TEST	LCpl CARTER TEST RANGE OPERATIONS	USMC	9	0	0.00

TOTAL PROGRAM DOLLARS 6461.44

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR MCAAP

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	D272	CHG PROP 5 IN/38 FULL	NAVY	9178	9178	603.71
H	D274	CHG PROP 5 IN/38 FULL	NAVY	1024	1024	67.36
L	D544	PROJ 155MM HE	ARMY	87000	87000	3095.20
H	D579	PROJ 155MM HERA M549	USMC	10215	0	143.01
M	H488	RKT 2.75 IN HE	ARMY	4104	4104	179.18
					TOTAL PROGRAM DOLLARS	4088.46

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	D505	PROJ 155MM ILLUM M485	USMC	4095	684	221.05
M	D544	PROJ 155MM HE	ARMY	100000	100000	2242.00
H	D579	PROJ 155MM HERA M549	USMC	10642	0	153.03
M	D680	PROJ 8 IN HE M106	ARMY	20000	20000	448.40
M	N335	FUZE PD M557	ARMY	10000	10000	164.07
					TOTAL PROGRAM DOLLARS	3228.55

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR ANAD

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	B642	CTG 60MM HE COMP B M720	ARMY	20000	20000	475.78
H	C236	CTG 81MM HE	ARMY	5458	5458	129.83
H	C256	CTG 81MM HE M374 SERIES	ARMY	1512	1512	35.97
H	C445	CTG 105MM HE M1 W/O FZ	ARMY	7340	7340	226.20
M	D680	PROJ 8 IN HE M106	ARMY	50000	50000	2202.25
				TOTAL PROGRAM DOLLARS		3070.03

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	C236	CTG 81MM HE	ARMY	1295	1295	30.80
H	C256	CTG 81MM HE M374 SERIES	ARMY	21000	21000	499.51
M	C445	CTG 105MM HE M1 W/O FZ	ARMY	4500	4500	136.23
H	C452	CTG 105MM SMK HC M84A1 W/ FUZE MT M577	ARMY	17122	17122	406.13
M	C704	CTG 4.2 IN HE	ARMY	428	428	8.67
M	C705	CTG 4.2 IN HE	ARMY	7266	7266	147.21
H	D510	PROJ 155MM HEAT CANNON LAUNCHED PROJ M712	USMC	100	0	8.16
M	D680	PROJ 8 IN HE M106	ARMY	10000	10000	440.45
				TOTAL PROGRAM DOLLARS		1677.16

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR LEAD

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
M	B632	CTG 60MM HE M49 SERIES	ARMY	42553	42553	802.35
H	C236	CTG 81MM HE	ARMY	34467	34467	659.59
H	N335	FUZE PD M557	ARMY	20000	20000	148.29
				TOTAL PROGRAM DOLLARS		1610.23

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	C256	CTG 81MM HE M374 SERIES	ARMY	1271	1271	29.42
H	C445	CTG 105MM HE M1 W/O FZ	ARMY	10148	10148	304.44
M	N285	FUZE MTSQ M577	ARMY	10000	10000	250.00
				TOTAL PROGRAM DOLLARS		583.86

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR SVDA

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	ZAPE	AMMO PECULIAR EQUIPMENT	ARMY	50	50	300.00
L	ZZNC	CNTR 30MM CNU-332/E	USAF	11795	0	1882.95
				TOTAL PROGRAM DOLLARS		2182.95

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	ZAPE	AMMO PECULIAR EQUIPMENT	ARMY	50	50	300.00
L	ZZNC	CNTR 30MM CNU-332/E	USAF	15267	0	2555.85
				TOTAL PROGRAM DOLLARS		2855.85

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR LBAD

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
M	B632	CTG 60MM HE M49 SERIES	ARMY	86875	86875	2065.97
H	C256	CTG 81MM HE M374 SERIES	ARMY	8685	8685	269.20
M	K092	MINE APERS M16	ARMY	125042	125042	1672.12
L	K143	MINE AP M18 W/ACCESS	ARMY	20000	20000	557.63
H	N335	FUZE PD M557	ARMY	20000	20000	328.13
				TOTAL PROGRAM DOLLARS		4893.05

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	C226	CTG 81MM ILLUM M301	ARMY	314	314	5.02
H	C256	CTG 81MM HE M374 SERIES	ARMY	8946	8946	277.27
M	K143	MINE AP M18 W/ACCESS	ARMY	38379	38379	1050.78
M	N285	FUZE MTSQ M577	ARMY	10000	10000	34.73
				TOTAL PROGRAM DOLLARS		1367.80

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR RRAD

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
M	A164	CTG 7.62MM LKD BALL M80	USAF	20286445	44253	1097.50
L	A222	CTG CAL .30 BLK	ARMY	1000000	1000000	575.60
L	B519	CTG 40MM TP M781	USAF	15996	15996	5.15
H	C445	CTG 105MM HE M1 W/O FZ	ARMY	45534	45534	1967.27
L	G881	GREN HD M67	ARMY	233000	233000	850.89
H	G881	GREN HD M67	USMC	13009	11018	16.44
M	H116	RKT 2.75 IN HE	ARMY	1300	1300	56.77
M	H490	RKT 2.75 IN HE	ARMY	3100	3100	135.38
M	H519	RKT 2.75 IN WP	ARMY	1400	1400	61.14
M	H826	RKT 2.75 IN HEDP	ARMY	1500	1500	65.51
L	J102	RKT MOTOR 2.75 IN MK 4	USAF	142	142	3.55
				TOTAL PROGRAM DOLLARS		4835.20

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	C445	CTG 105MM HE M1 W/O FZ	ARMY	51506	51506	2225.29
M	C704	CTG 4.2 IN HE	ARMY	694	694	14.09
M	C705	CTG 4.2 IN HE	ARMY	3230	3230	65.44
M	G881	GREN HD M67	ARMY	180000	180000	655.74
H	G881	GREN HD M67	USMC	53891	31171	214.54
M	H116	RKT 2.75 IN HE	ARMY	1150	1150	50.22
M	H490	RKT 2.75 IN HE	ARMY	2150	2150	93.90
M	H519	RKT 2.75 IN WP	ARMY	1350	1350	58.96
M	H826	RKT 2.75 IN HEDP	ARMY	1300	1300	56.77
				TOTAL PROGRAM DOLLARS		3434.95

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR SEAD

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	C236	CTG 81MM HE	ARMY	732	732	14.64
H	D662	CHG PROP M188	ARMY	5000	5000	243.25
				TOTAL PROGRAM DOLLARS		257.89

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	C226	CTG 81MM ILLUM M301	ARMY	123	123	1.97
H	D662	CHG PROP M188	ARMY	5000	5000	243.25
				TOTAL PROGRAM DOLLARS		245.22

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR SIAD

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
M	B536	CTG 40MM SIGNAL M585	USAF	2737	2737	75.47
M	C479	CTG 105MM SMK HC M84A1 W/O FUZE	USMC	20000	606	527.65
M	H488	RKT 2.75 IN HE	ARMY	350	350	26.86
M	H489	RKT 2.75 IN HE	ARMY	13150	13150	1009.22
M	H534	RKT 2.75 IN HE	ARMY	1200	1200	92.10
M	K143	MINE AP M18 W/ACCESS	USMC	20024	0	180.27
				TOTAL PROGRAM DOLLARS		1911.57

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	B630	CTG 60MM SMK WP M302	ARMY	4000	4000	53.68
L	B632	CTG 60MM HE M49 SERIES	ARMY	36526	36526	490.18
H	C226	CTG 81MM ILLUM M301	ARMY	432	432	6.91
M	H488	RKT 2.75 IN HE	ARMY	250	250	19.19
M	H489	RKT 2.75 IN HE	ARMY	1850	1850	141.98
M	H534	RKT 2.75 IN HE	ARMY	600	600	46.05
L	L434	FLARE IR RR-119	USAF	1000	0	10.84
				TOTAL PROGRAM DOLLARS		768.83

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR TEAD

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
M	A164	CTG 7.62MM LKD BALL M80	USAF	20208145	20208145	2332.02
L	A557	CTG CAL .50 BALL	ARMY	115800	115800	46.37
H	C236	CTG 81MM HE	ARMY	589	589	11.78
H	C704	CTG 4.2 IN HE	ARMY	3767	3767	244.08
L	C706	CTG 4.2 IN HE	ARMY	3426	3426	221.97
L	DY32	TMU-28 SPRAY TANK	USAF	86	86	55.18
H	E890	CBU-87B/B	USAF	250	12	37.22
L	G930	GRENADE SMOKE WHITE	USAF	33728	33728	350.99
L	G940	GRENADE SMOKE GREEN	USAF	28862	28862	377.11
L	Z82Y	TCM MAINT PLAN	ARMY	1303	1303	1733.97
L	ZAPE	AMMO PECULIAR EQUIPMENT	ARMY	50	50	300.00
					TOTAL PROGRAM DOLLARS	5710.69

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
M	B642	CTG 60MM HE COMP B M720	ARMY	4567	4567	108.65
H	C256	CTG 81MM HE M374 SERIES	ARMY	1324	1324	31.50
M	C704	CTG 4.2 IN HE	ARMY	4075	4075	264.04
L	DY32	TMU-28 SPRAY TANK	USAF	86	86	57.87
H	E890	CBU-87B/B	USAF	250	0	39.03
L	Z82Y	TCM MAINT PLAN	ARMY	530	530	750.00
L	ZAPE	AMMO PECULIAR EQUIPMENT	ARMY	50	50	300.00
					TOTAL PROGRAM DOLLARS	1551.09

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR UMDA

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	DY32	TMU-28 SPRAY TANK	USAF	15	15	22.32
				TOTAL PROGRAM DOLLARS		22.32

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	DY32	TMU-28 SPRAY TANK	USAF	15	15	23.41
				TOTAL PROGRAM DOLLARS		23.41

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR CONTRACTORS

FISCAL YEAR 91

RISK	DODIC	NOMENCLATURE	INST	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	G119	FMU-139A/B	COCO	USAF	170000	0	2800.00
L	D624	PROJ 8 IN RAP M650	IAAP	ARMY	523	523	8.06
H	D501	PROJ 155MM HE ADAM	KAAP	USMC	133	0	1.90
H	D502	PROJ 155MM HE ADAM	KAAP	USMC	664	0	7.58
H	D562	PROJ 155MM HE (AP)	KAAP	USMC	26083	0	309.93
L	D563	PROJ 155MM HE (AP)	KAAP	ARMY	34000	34000	768.94
H	D563	PROJ 155MM HE (AP)	KAAP	USMC	21775	4127	212.67
L	D501	PROJ 155MM HE ADAM	LAAP	ARMY	12000	12000	1464.79
M	B546	CTG 40MM HEDP M433	MAAP	ARMY	504000	504000	2363.76
M	B568	CTG 40MM HE M406	MAAP	USAF	1897	1224	2.55
H	N340	FUZE PD M739 SERIES	MAAP	ARMY	60000	60000	868.80

TOTAL PROGRAM DOLLARS 8808.98

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	INST	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	D509	PROJ 155MM HE (AT)	IAAP	USMC	139	0	3.29
H	D509	PROJ 155MM HE (AT)	IAAP	USMC	43	0	1.02
L	D624	PROJ 8 IN RAP M650	IAAP	ARMY	500	500	7.71
H	D562	PROJ 155MM HE (AP)	KAAP	USMC	11103	0	336.53
L	D563	PROJ 155MM HE (AP)	KAAP	ARMY	30000	30000	588.10
L	D501	PROJ 155MM HE ADAM	LAAP	ARMY	12000	12000	1464.79
H	D501	PROJ 155MM HE ADAM	LAAP	USMC	28	0	4.07
H	D502	PROJ 155MM HE ADAM	LAAP	USMC	25	0	3.63
M	B546	CTG 40MM HEDP M433	MAAP	ARMY	504000	504000	2363.76
M	B568	CTG 40MM HE M406	MAAP	NAVY	2300	0	5.38
M	B571	CTG 40MM HE M383 LKD	MAAP	NAVY	122117	100343	285.75
M	B632	CTG 60MM HE M49	MAAP	ARMY	162268	162268	4794.58
H	N340	FUZE PD M739 SERIES	MAAP	ARMY	60000	60000	868.80

TOTAL PROGRAM DOLLARS 10727.41

APPENDIX B

MAJOR MAINTENANCE PROGRAM DATA

FOR XXXX (NOT ALLOCATED)

FISCAL YEAR 91

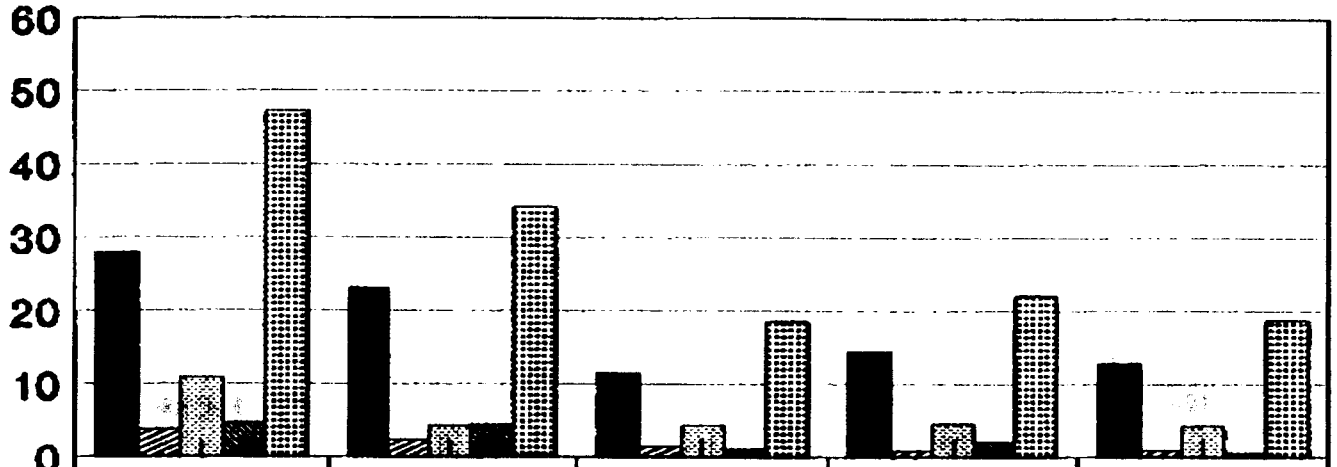
RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
L	C347	CTG 3 IN/50 HC RF MKS	NAVY	122	0	0.00
L	C348	CTG 3 IN/50 HC RF MKS	NAVY	595	0	0.00
H	E167	MK 77 MOD 5 FIREBOMB	NAVY	2327	0	0.00
M	E482	BOMB MK 82 NTP	NAVY	500	24	0.00
H	E821	CBU-72/B	NAVY	1010	0	0.00
L	M644	FIRING DEVICE	NAVY	4300	0	0.00
L	YY49	CNU-327 CONTAINER	USAF	80	0	0.00
				TOTAL PROGRAM DOLLARS		0.00

FISCAL YEAR 92

RISK	DODIC	NOMENCLATURE	SERV	REQMT	ON HAND ASSETS	PROGRAM DOLLARS (X 1000)
H	G900	GREN HAND INC	USMC	6045	0	0.00
				TOTAL PROGRAM DOLLARS		0.00

MAJOR MAINTENANCE PLAN OVERVIEW

(MILLIONS OF DOLLARS)



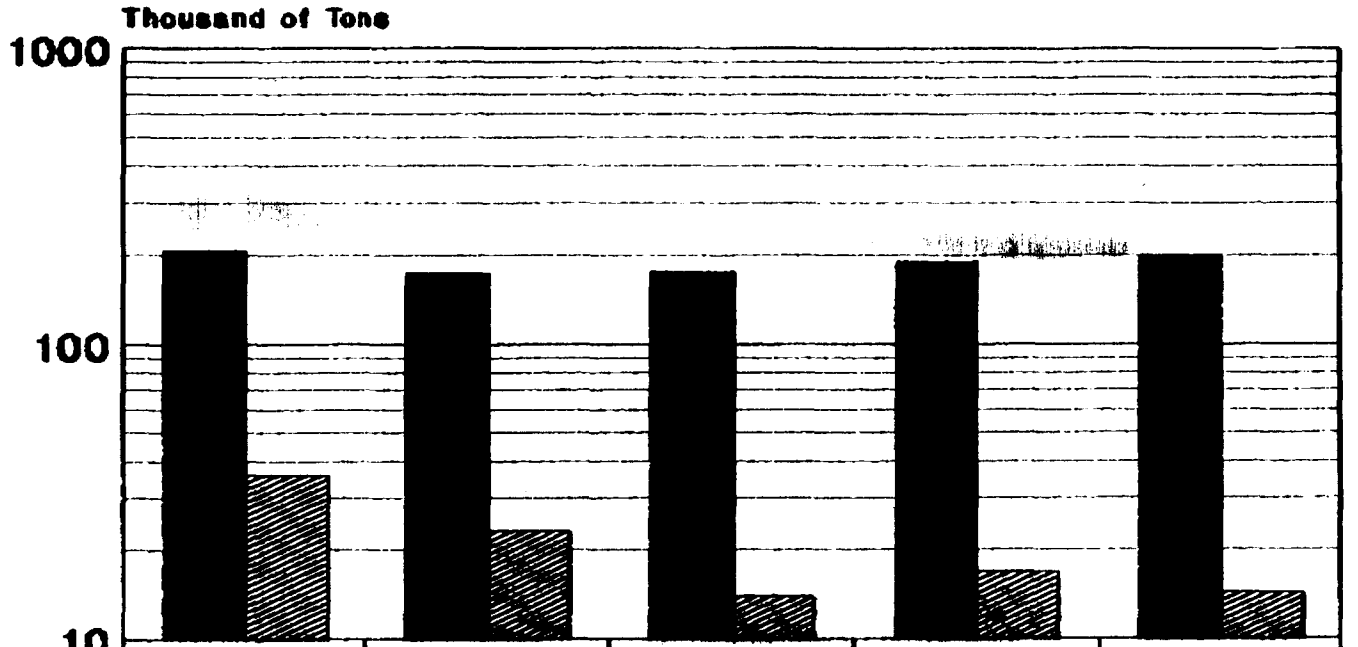
	91	92	93	94	95
ARMY	27.965	23.14	11.543	14.478	12.97
NAVY	3.763	2.35	1.452	0.883	0.933
USAF	10.893	4.267	4.352	4.561	4.236
USMC	4.658	4.443	1.186	2.198	0.639
FY TOTAL	47.279	34.2	18.533	22.12	18.778

ARMY NAVY USAF USMC FY TOTAL

CONUS WHLS UNSERV/RENOV PROGRAM

MAJOR MAINTENANCE PROGRAM SUMMARY

(ALL SERVICES)



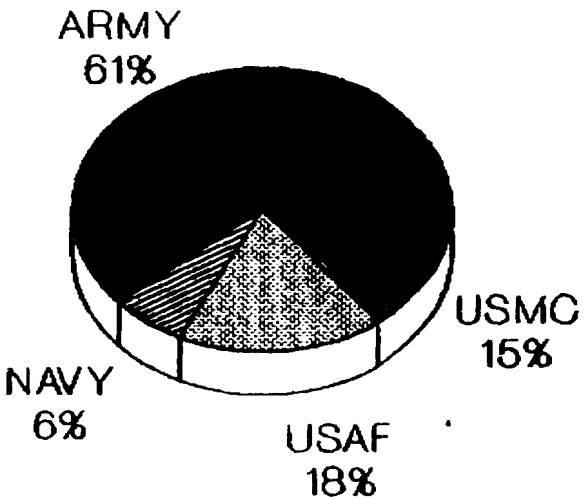
	91	92	93	94	95
STOCKPILE	209.923	174.546	178.079	190.891	200.767
PROGRAM	35.909	23.267	13.988	16.924	14.313

STOCKPILE PROGRAM

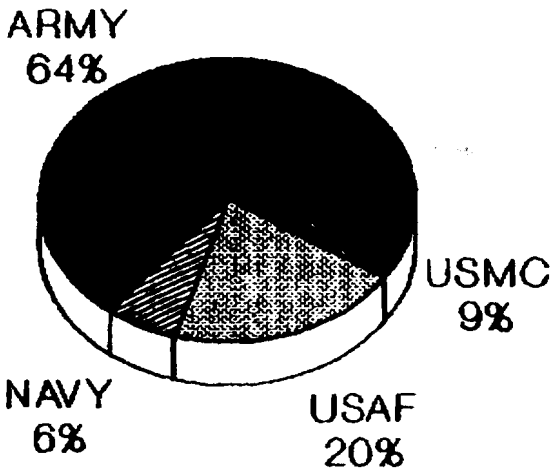
CONUS WHLS UNSERV/RENOV PROGRAM

MAJOR MAINTENANCE PLAN

FY 91 - FY 95



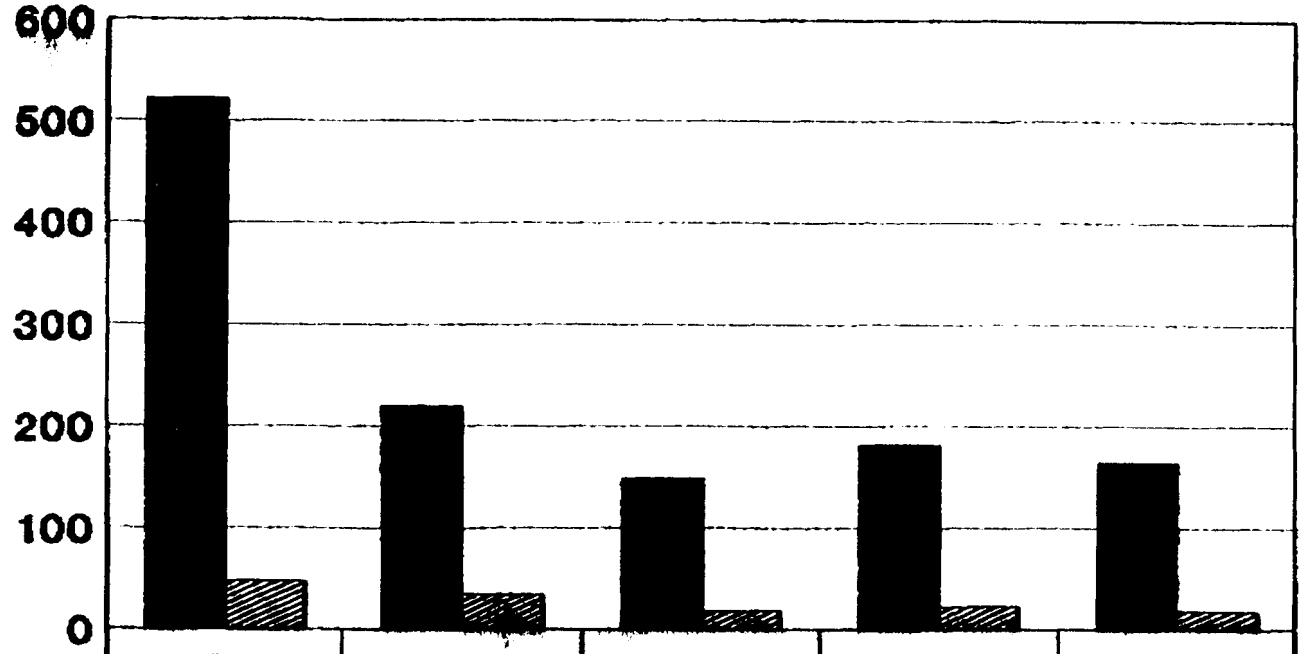
BREAKOUT BY TONS



BREAKOUT BY DOLLARS

ACQUISITION VS MAINTENANCE COSTS

(MILLIONS OF DOLLARS)

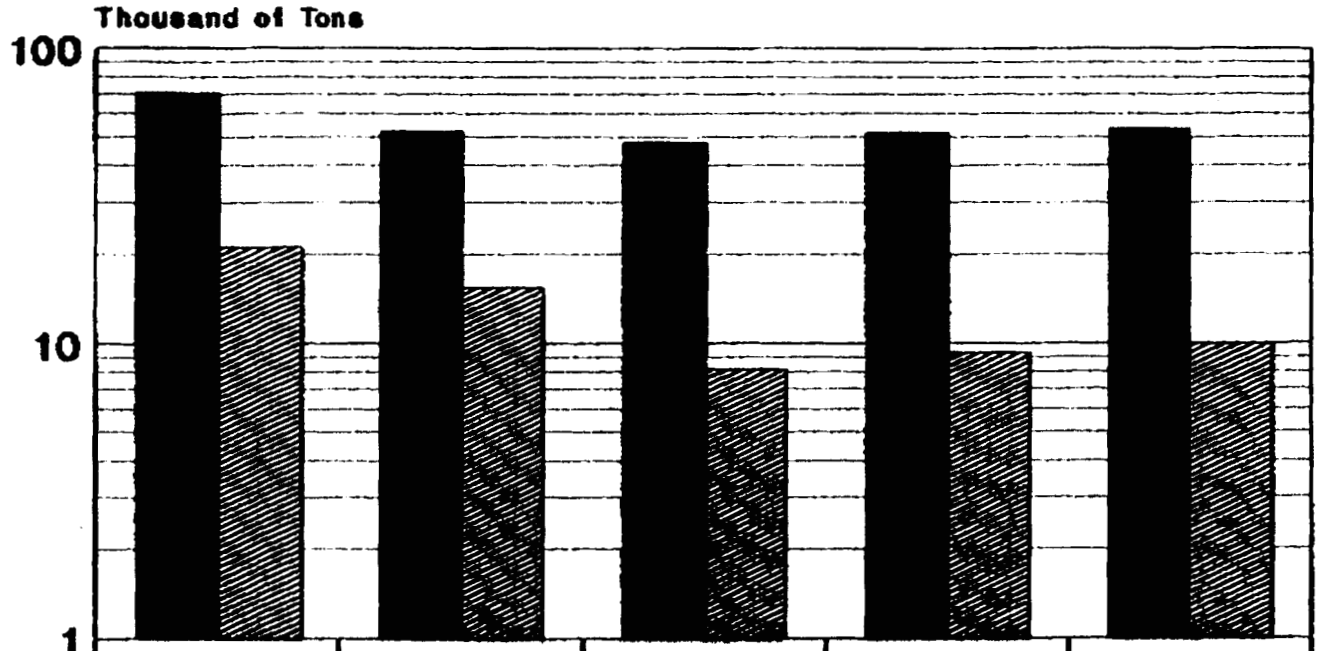


	91	92	93	94	95
ACQ COST	521.99	220.658	148.172	182.631	165.641
MAINT COST	47.279	34.2	18.533	22.12	18.778

ACQ COST MAINT COST

MAJOR MAINTENANCE PROGRAM SUMMARY

(ARMY)



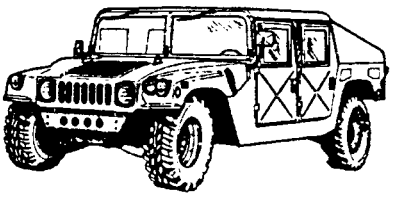
	91	92	93	94	95
STOCKPILE	71.429	52.229	48.338	51.788	54.102
PROGRAM	21.124	15.491	8.15	9.286	9.919

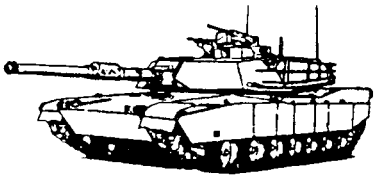
STOCKPILE PROGRAM

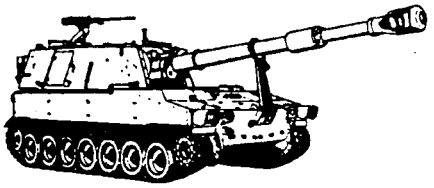
CONUS WHLS UNSERV/RENOV PROGRAM

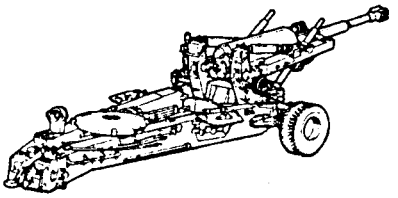
DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

COMBAT, ARTILLERY, AND TACTICAL (C.A.T.) VEHICLES
DEPOT MAINTENANCE STUDY









PREPARED FOR:

DEFENSE DEPOT MAINTENANCE COUNCIL

31 JANUARY 1991

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES
COMBAT, ARTILLERY, AND TACTICAL (C.A.T.) VEHICLES
DEPOT MAINTENANCE STUDY

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EXECUTIVE SUMMARY

COMBAT, ARTILLERY, AND TACTICAL (C.A.T.) VEHICLES

DEPOT MAINTENANCE STUDY

1. Reference:

a. Memorandum, Deputy Secretary of Defense, 30 June 1990, subject: Strengthening Depot Maintenance Activities.

b. Memorandum, Office of the Assistant Secretary of Defense for Production and Logistics, 8 August 1990, subject: Defense Depot Maintenance Council Meeting Minutes, 24 July 1990.

c. Headquarters, U.S. Army Materiel Command Maintenance Division tasking during VENUS televideo conference, 26 July 1990.

2. As references requested, a multi-service study team has examined existing Department of Defense (DOD) depot maintenance capabilities for Combat, Artillery, and Tactical (C.A.T.) vehicles. The team has then looked for ways to reduce the cost of depot maintenance on these vehicles over Fiscal Years (FY) 1991 through 1995 through increased interservice workload consolidation, increased utilization of depot capacity, and increased competition. The team has recommended actions to reduce depot maintenance cost, and has quantified the total predicted savings that would result from these actions for FY 1991 through FY 1995. The team has also looked at the long range effects of its recommendations through FY 1996 and FY 1997, but has identified these separately from the FY 1991 through FY 1995 savings.

3. The study team is composed of representatives from the Army, Navy, Air Force, and Marine Corps. It is chaired by the U.S. Army Tank-Automotive Command (TACOM), Warren, MI. In preparing this study, members met seven times at Headquarters TACOM. Two team members previously participated in the Combat Wheeled Vehicle Action Team study, and as part of that study team had visited the depots covered in this study. In addition, the team made site visits to Marine Corps Logistics Base - Albany and Red River Army Depot.

4. The study team's analysis and recommendations in the three areas of interservicing, capacity utilization, and competition are summarized below:

a. Interservicing.

(1) The Marine Corps will interservice its M1 Abrams tank depot repair with the Army, bringing interservice support to 8% of the total Marine Corps C.A.T. workload. However, no further increase in inter-

servicing is practical. The Air Force and the Navy have no depot repair capability for C.A.T. vehicles, and currently obtain all of their required secondary components through interservicing with the Army. The Marine Corps C.A.T. vehicle depot repair capability is small, and cannot effectively absorb any of the large Army workload.

(2) The study team has recommended no actions with regard to interservicing other than the USMC M1 which will be overhauled at Anniston Army Depot.

b. Capacity utilization.

(1) Previous JDMAG reports have overstated the excess capacity in Army depots. A study directed by Commander, DESCOM in May 1990 adjusted the excess downward. However, this latest study still shows that substantial excess capacity exists.

(2) The study team examined laying away, or mothballing, this excess. The team found that by reducing the number of work positions, and by consolidating and streamlining the remaining positions, all or part of some buildings could be placed in layaway. Laying away these areas would reduce their cost of ownership, e.g. basic maintenance and utilities costs, without irreversibly affecting the capacity of the depots. Because the facilities and equipment in these laid away areas would remain in place, they could be quickly reactivated if needed for mobilization. The study team estimates that savings from laying away excess capacity would total $9.4 for the period FY 1991 through FY 1995, and $6.1 for the period FY 1996 through FY 1997.

(3) As total C.A.T. depot repair workload decreases over the coming years, further cost savings beyond initial layaway should be sought through consolidating the workload from several depots at single locations. The most practical consolidation to be considered at this time is the transfer of the self-propelled artillery workload now at LEAD to RRAD and the OCONUS workload at Mainz to ANAD, RRAD, and TEAD. This consolidation would increase capacity utilization of these CONUS depots, and begin a process of consolidation that will become necessary as C.A.T. depot repair workload diminishes. Savings projected from this consolidation are $303.7M for FY 1991 through FY 1995; and $208.6M for FY 1996 through FY 1997.

(4) The study team examined relocation of the CAT workload from one or both Marine Corps Logistics Base (MCLB) depot maintenance activities, to the Army to increase Army depot capacity utilization. The MCLBs are composite logistics planning, Item Management and National Maintenance Point (NMP) operations, Depot Maintenance Activities (DMA) and soldier training sites. The two Marine Corps Depots are small, modern, well equipped/ maintained facilities, geographically located to provide support to the Fleet Marine Force. They are an integral part of the Corps weapon system development/management and logistics support system. Moving the Combat, Artillery and Tactical vehicle workload from Barstow to Albany and Army depots, or from Albany and Barstow both to Army depots can be done.

It should be noted that the DMA's at Albany and Barstow are affected, and the MCLB's remote storage activity will be affected. This action may eliminate duplication of capability in DOD depots and improve overall capacity utilization. The elimination of Marine Corps DMA's results in the loss of a modern/well-equipped depot maintenance activity. This option has the potential to disrupt Marine Corps logistics linkages and customer-supplier relationships with the operating forces and may result in a base closure. Also, at the MCLB DMA's, 30% of the staff are unifored military that serve in on-the-job training for 18-24 month rotations. Comparable training sites would be required to support this training need if the MCLB DMA workload is transferred to Army depots. This action is not recommended since average billing rates at MCLBs are $10/hr less than average billing rates at Army Depots. There is no potential for transfer of depot work from Army to MCLBs as utilization rates are, and are projected to remain above 100%.

(5) The planned consolidated maintenance facility (CMF) at TEAD will combine the depot repair of tactical vehicles at one location for a projected total savings of $40.2M for the period FY 1991 through FY 1995, and $26.8M for the period FY 1996 through FY 1997.

(6) The study team's recommendations with regard to capacity utilization are:

(a) Lay away excess capacity at ANAD, RRAD, LEAD, and TEAD.

(b) Transfer self-propelled artillery repair now being done at LEAD to RRAD.

(c) Transfer current MZAD workload to CONUS depots beginning in FY 1993.

(d) Maximize use of CMF at TEAD.

c. Competition.

(1) If restrictions on competing depot repair workload between the public and public as well as public and private sectors were removed, competition savings could be realized. The study team was advised that for Army equipment, core workload comprises end items (and their associated secondary items) that are identified as ERC A and P items on the TOE. For Army C.A.T. workload, per AR 220-1 above core workload is limited to tactical vehicles only. The study team estimates that 20% of the tactical vehicle fleet is ERC B and therefore the Army workload in secondary item depot repair is a candidate for competition. The Marine Corps is currently evaluating its core workload and is not included in this study. On the basis of 20% of fleet and an estimated 20% savings from competition, it is estimated that a total of $18.2M could be saved on their repair for the period FY 1992 through FY 1995. For the period FY 1996 through FY 1997, an additional $9.1M in savings is estimated.

(2) The study team's recommendations regarding competition are to abolish restrictions on competing depot-level repair and to compete above-core workload.

5. This study alone cannot recommend depot closings because each depot looked at by the study team has a substantial workload of items other than C.A.T. vehicles. Any recommendations to close depots would have to be based on a cross-indexed analysis of all workload at each depot.

6. The projected C.A.T. vehicle capacity percent utilization of each of the seven depots studied is estimated to be as follows if all of the actions which the study team recommended were implemented:

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Albany	101.5	106.4	103.7	102.5	102.5	102.3	103.3
ANAD	98.0	90.0	90.0	90.0	90.0	90.0	90.0
Barstow	106.6	109.0	112.3	111.2	113.1	109.5	113.4
LEAD	90.0	90.0	0.0	0.0	0.0	0.0	0.0
RRAD	90.0	90.0	90.0	90.0	90.0	90.0	90.0
SAAD	60.1	50.4	63.4	59.0	54.9	51.0	47.4
TEAD	90.0	90.0	90.0	90.0	90.0	90.0	90.0
MZAD	38.4	30.4	0.0	0.0	0.0	0.0	0.0

Note that the above figures show only C.A.T. vehicle capacity utilization. All of the depots also have capacity for repair of other items which this study does not cover.

7. The study team projects the following total savings to result from all recommended actions for the period FY 1991 through FY 1995, and for the additional period FY 1996 through FY 1997:

TOTAL SAVINGS BREAKOUT
(YEARLY SAVINGS)

CAPACITY UTILIZATION	FY91	FY92	FY93	FY94	FY95	FY96	FY97
• LAYAWAY	.27	3.23	1.52	1.83	2.54	2.91	3.20
• CONSOLIDATION (LEAD TO RRAD)	0	0	2.07	6.36	6.36	6.36	6.36
(MZAD TO CONUS)			94.00	97.00	98.00	98.00	98.00
• TEAD CMF	0	0	13.40	13.40	13.40	13.40	13.40
CAPACITY SUB-TOTAL	.27	3.23	110.99	118.59	120.30	120.69	120.96
COMPETITION	0	4.56	4.56	4.56	4.56	4.56	4.56
INTERSERVICING	0	0	0	0	0	0	0
TOTAL	.27	7.79	115.55	123.15	124.86	125.23	125.52

8. It should be noted that the Defense Business Operation Fund (DBOF) cost methodology was not utilized in the C.A.T. study. Further, MZAD workload reallocation savings must be viewed as tentative pending approval of MZAD utilization study directed by Mr. Dausman, Dep Asst Sec for procurement, HQDA and a final agreement between CG AMC and CINC USAREUR.

9. To provide for an orderly transition, the recommendations should be phased in over a two-year period beginning in FY 1991.

10. These recommendations capitalize on the successful formal and informal depot maintenance interservicing relationships already in existence, and they will maximize the overall cost-effectiveness of depot maintenance for Combat, Artillery, and Tactical vehicles.

Mr. Brian S. Shortell
USA TACOM
Study Group Leader

USA

Mr. William J. Walker
USA DESCOM
DESCOM Representative

Mr. Thomas J. Holly
USA TACOM
TACOM Representative

USMC

Mr. Ron Johnson
MCLB Albany DMA
USMC Representative

LTC R. T. Forte
Code LPP 3
HQ USMC Representative

USN

Mr. Gary Lind
Naval Fac Eng Cmd
Navy Representative

USAF

Mr. Bobby J. Morgan 16 Jan 91
Warner Robbins ALC/LVM
USAF Representative

DEFENSE DEPOT MAINTENANCE COUNCIL

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

COMBAT, ARTILLERY, AND TACTICAL VEHICLES (C.A.T.)

DEPOT MAINTENANCE STUDY

1. Study Methodology.

a. Scope: This study analyzes DOD depot maintenance capacity and workload for C.A.T. vehicles used by the Army, Navy, Air Force, and Marine Corps. It examines ways to reduce the cost of depot maintenance on these vehicles over Fiscal Years (FY) 1991 through 1995 through increased interservice workloading, increased utilization of depot capacity, and increased competition. It recommends actions to reduce depot maintenance cost, and it quantifies the total predicted savings that would result from these actions for FY 1991 through FY 1995. It also predicts the long range effects of its recommendations through FY 1996 and FY 1997, but identifies these separately from the FY 1991 through FY 1995 savings.

b. Study assumptions:

NOTE

This study does not contain workload data that will result from the Desert Shield operation. This study also does not include workload from evolving concepts such as the Reliability Centered Inspect and Repair Only as Necessary (RC-IRON) process.

For the purpose of this study, artillery, whether towed or self-propelled, are deemed combat vehicles. All related weapon systems and equipment are included. This means that for each end item, all on-board equipment directly related to the mission of the vehicle, such as, the main gun fire control system on the M1 are included in this study as elements of M1 Abrams depot maintenance. Non-related systems are not included. This means that non-tactical vehicles (administrative use vehicles) do not constitute depot maintenance workload. These wheeled vehicles are characterized by the fact that they are not "Adopted Items of Army Materiel" and are not included in chapter 2 of SB 700-20 but are included in chapter 6 "Non-Tactical Vehicles" and supported accordingly. Additionally, the following assumptions were made:

(1) Systems not fielded are not included.

(2) Funding for consolidation will be available.

(3) Depot Maintenance Interservicing (DMI) decisions are implemented.

(4) Availability of skilled personnel at each location is given.

(5) System peculiar test/shop equipment will transfer to a new location.

(6) Depot workload for this study is based on funding levels.

(7) Performance, quality and productivity of the depots reviewed are considered equal.

(8) Capacity is defined in terms of direct manhours and is calculated by multiplying the maximum number of work positions times 1615 hours.

(9) CAT workload at Mainz Army Depot will return to CONUS in FY93.

c. Study Group Members:

NAME	ASSIGNMENT	ORG	PHONE (DSN)
BRIAN SHORTELL	CHAIRMAN	TACOM	786-7430
COL HODGES	PRINCIPAL	USMC-ALBANY	567-5301
RON JOHNSON	PRINCIPAL	USMC-ALBANY	567-5301
LTC R. FORTE	PRINCIPAL	HQ USMC	226-1060
B.J. MORGAN	PRINCIPAL	USAF/WR-ALC	468-4262
COL W. NEWSOM	PRINCIPAL	USAF/WR-ALC	468-6488
GARY LIND	PRINCIPAL	NAVSEA	325-8185
DICK HUSSON	MEMBER	AMCCOM	793-5863
TRAVIS WATTERS	MEMBER	AMCCOM	793-0747
THOMAS HOLLY	MEMBER	TACOM	786-8279
RICHARD BUJAK	MEMBER	TACOM	786-7351
GAIL MARTIN	MEMBER	TEAD	790-2746
TERRY THOMPSON	MEMBER	TEAD	790-2918
FRANK BIBB	MEMBER	ANAD	571-4166
DWIGHT BYRD	MEMBER	RRAD	829-3312
BARRY FARNER	MEMBER	DESCOM	570-9748
ART SOLLENBERGER	MEMBER	DESCOM	570-9744
BILL WALKER	MEMBER	DESCOM	570-9744

d. Site visits:

(1) The planned study methodology and schedule included site visits for audit purposes. Telephone interviews with team members from the previous study were substituted for 100% "repeat" visits by members of this team; however, the team did conduct on-site evaluations at MCLB-Albany, GA and RRAD, Texas.

(2) Some study group members met at Headquarters U.S. Army Depot Systems Command (HQ DESCOM), Chambersburg, PA on 17-20 September 1990 with personnel from other study groups, DESCOM, and Headquarters Army Materiel Command (HQ AMC). The purpose was to prepare a consolidated Army plan for depot maintenance of rotary wing aircraft systems; combat, artillery, and tactical vehicles; conventional munitions; rail equipment; gas turbine engines and compressors; and general purpose equipment.

e. Data Collection:

(1) The team obtained and studied data from numerous sources. For example, team members obtained U.S. Army, Navy, Marine Corps, and Air Force C.A.T. vehicle inventories from service representatives. Through study team discussions they became familiar with the maintenance philosophy of each service and its impact upon the type and volume of depot repair work done. The study team obtained from each service all depot locations, their current and planned workload, and their capacity to support C.A.T. vehicle repair. They also obtained for each service the current and planned contract maintenance for depot level repair of C.A.T. vehicles. Team members obtained data from other ongoing DDMC study groups such as the Joint Logistics Commanders (JLC)/ Joint Policy Coordinating Group - Depot Maintenance (JPCG-DM) capacity study group and the Air Force cost comparability study group. Team members also reviewed the Deputy Secretary of Defense memorandum of 30 June 1990, subject: Strengthening Depot Maintenance Activities; the 8 August 1990 defense depot maintenance council meeting minutes; previous Defense Management Record Decisions (DMRD) pertaining to depot maintenance; and the previous Combat Wheeled Vehicle action team report. Team members obtained and examined all existing depot maintenance interservice support agreements (DMISA) pertaining to C.A.T. vehicles.

(2) The study team collected data under severe time constraints; therefore the data represents a macro view of depot characteristics. Refinements of the data may affect the total savings ultimately resulting from the report recommendations, but will not affect the order of preference of the recommendations themselves.

2. Analysis:

a. Introduction. The study team arrayed and analyzed the data it collected to develop a profile of the current situation; to identify the potential for savings from increased competition, increased capacity utilization, and increased interservicing; and to determine the extent of these potential savings. To do this the study team categorized C.A.T.

vehicles, and systematically compared each affected depot maintenance location with respect to maintenance and support facilities; equipment; skills; technical support; environmental considerations; organic, contract, and interservice workload; and changes in capacity utilization and interservicing expected to result from recommended actions.

b. Categories of C.A.T. vehicles. The study team analyzed the C.A.T. vehicles of all services and consolidated them into categories for study. It was necessary to establish these categories because C.A.T. systems similar in design and mission may differ significantly with respect to maintenance drivers, e.g. requirements for Automatic Test Equipment (ATE) and depot maintenance plant equipment (DMPE). Table 1 depicts the C.A.T. vehicles evaluated.

Table 1. C.A.T. Vehicle Systems

Name	Mission	Component Service	Type	Depot Facility	PRIME Contractor
HEAVY COMBAT					
ABRAMS TANK	Main Battle Tank	USA, USMC	120 MM 105 MM	ANAD MZAD	GDLS
M60 FOV	Main Battle TANK	USA, USMC	105 MM	ANAD MZAD	GDLS
M551/A1	Airborne Assault Vehicle	USA	152 MM	ANAD	Cad Gage
M88A1	Recovery Vehicle	USA, USMC	Tracked	ANAD, MZAD Albany, Barstow	GDLS
M728 CEV	Entrenching VEHICLE	USA	165 MM	ANAD MZAD	GDLS
AVLB	Bridging	USA, USAM	Tracked	ANAD	GDLS
AAV7A1	Assault Vehicle	USMC	Amphib.	Albany, Barstow	FMC
LIGHT COMBAT					
BFVS MLRS	Armored Personnel Carrier	USA	Tracked	RRAD MZAD	FMC
M113 FOV	Armored Personnel Carrier	USA	Tracked	RRAD MZAD	FMC
LAV FOV	Assault Vehicle	USMC	Wheeled	Albany, Barstow	GM
VULCAN	Air Defense	USA	20MM Towed	RRAD	GE

Table 1. C.A.T. Vehicle Systems (cont'd)

Name	Mission	Component Service	Type	Depot Facility	Prime Contractor
ARTL'Y					
M109	Ground Support	USA, USMC	155MM	LEAD, MZAD Albany Barstow	BMY
M110	Ground Support	USA, USMC	8" GUN	LEAD, MZAD Albany Barstow	BMY
M101	Ground Support	USA, USMC	105MM	LEAD Albany Barstow	RIA
M198	Ground Support	USA, USMC	155MM	LEAD Barstow	RIA
M578	Ground Support	USA, USMC	Self Prop'ld	LEAD, MZAD Albany Barstow	BMY
M102	Ground Support	USA	105MM	LEAD	RIA
M114	Ground Support	USA, USMC	155 MM	LEAD Albany Barstow	RIA
WHEELED VEHICLES					
LIGHT	Ground Support	NAVY, USA USMC, AF	1/4 To 2 Ton	Albany TEAD, MZAD Barstow	N/A
MEDIUM	Ground Support	USA, USMC	2 1/2 To 5 Ton	Albany TEAD, LEAD MZAD Barstow	N/A
HEAVY	Ground Support	USA, USMC	Greater Than 5 Ton	ALBANY MZAD TEAD, LEAD Barstow	N/A
TRAILERS	Ground Support	USMC, USA NAVY	Wheeled	Albany MZAD TEAD, LEAD Barstow	N/A

c. The study team collected and analyzed current Depot Maintenance Interservice Support Agreements (DMISA) pertaining to C.A.T. vehicles. Table 2 lists the current DMISAs involving all services. For each DMISA it identifies the agent or maintenance manager (the organization responsible for doing the work specified in the DMISA), the weapon system principal user (the customer of the DMISA), and the source of repair. Table 3 shows the non-DMISA workload drivers.

Table 2. C.A.T. Vehicle Depot Maintenance Interservice Support Agreement

WEAPON SYSTEM	AGENT (MAINT MANAGER)	PRINCIPAL USER	SOURCE OF REPAIR
M1 Tank	Army (TACOM)	Army Marine Corps	ANAD
Vulcan Cannon	Air Force	Army	Air Force

Table 3. C.A.T. Vehicle Non-DMISA

WORKLOAD	LOCATION OF DEPOT MAINTENANCE
HEAVY COMBAT VEHICLES	
M1	ANAD
M60A3	ANAD
M60A1	ANAD MCLB-ALB MCLB-BAR
M551	ANAD
M88	ANAD MCLB-ALB MCLB-BAR
M578	LEAD MCLB-ALB MCLB-BAR
CEV DOZER	ANAD
AVLB	ANAD
AAV7A1	MCLB-ALB MCLB-BAR
LIGHT COMBAT VEHICLES	
BFVS	RRAD
M113	RRAD
MLRS	RRAD
LAV	MCLB-ALB MCLB-BAR
M9 ACE	TEAD
ARTILLERY	
M109	LEAD MCLB-ALB MCLB-BAR
M110	LEAD MCLB-ALB MCLB-BAR
M198	LEAD MCLB-BAR
M101	LEAD MCLB-ALB MCLB-BAR
M105	LEAD MCLB-ALB MCLB-BAR
M114	LEAD MCLB-ALB MCLB-BAR
TACTICAL VEHICLES (NOTE 1)	
LIGHT	TEAD MCLB-ALB MCLB-BAR
MEDIUM	TEAD MCLB-ALB MCLB-BAR
HEAVY	TEAD MCLB-ALB MCLB-BAR

NOTE 1 - TACTICAL VEHICLES ARE LISTED BY CAPACITY CLASS VICE INDIVIDUAL SYSTEM DESIGNATIONS BECAUSE OF THE VOLUME OF LINs.

The percent of each service's workload that is planned to be interserviced for FY 1991 through FY 1997 is shown in tables 4 (Navy), 5 (Air Force), 6 (Marine Corps) and 7a-7f (Army), which are explained further in paragraph 2d.

d. Workload analysis.

(1) The first step in analyzing C.A.T. vehicle depot maintenance was to evaluate all currently planned workload. This workload for FY 1991 through FY 1997 is displayed by service in tables 4 (Navy), 5 (Air Force), 6 (Marine Corps) and 7-7d (Army). Each table splits the service's total workload into organic work, contract work, and interservice work. Each shows the total cost and total direct labor manhour requirement for the service's workload. Tables 7a, 7b, 7c, and 7d separate the Army workload into four vehicle categories and display the same data as the previous charts. The four categories are: heavy combat, light combat, artillery and tactical. The Army chart organic workload lines include the MZAD workload.

Table 4. Navy C.A.T. Vehicle Workload Distribution

Navy C.A.T. Vehicle Workload Distribution
Current Projections

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Contract	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interservice	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.1
% Total $	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total Dollars (Millions)	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.2	$ 0.1
Total Manhours (Millions)	0.004	0.003	0.003	0.003	0.003	0.002	0.002

Table 5. Air Force C.A.T. Vehicle Workload Distribution

Air Force C.A.T. Vehicle Workload Distribution
Current Projections

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Contract	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interservice	$ 0.5	$ 0.5	$ 0.5	$ 0.4	$ 0.4	$ 0.4	$ 0.3
% Total $	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Total Dollars (Millions)	$ 0.5	$ 0.5	$ 0.5	$ 0.4	$ 0.4	$ 0.4	$ 0.3
Total Manhours (Millions)	0.010	0.009	0.008	0.007	0.006	0.006	0.006

Table 6. Marine Corps C.A.T. Vehicle Workload Distribution

Marine Corps C.A.T. Vehicle Workload Distribution
Current Projections

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$ 83.5	$ 84.2	$ 85.0	$ 82.7	$ 85.6	$ 88.3	$ 91.0
% Total $	92.57%	92.43%	92.28%	91.87%	91.90%	91.91%	91.92%
Contract	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interservice	$ 6.7	$ 6.9	$ 7.1	$ 7.3	$ 7.5	$ 7.8	$ 8.0
% Total $	7.43%	7.57%	7.72%	8.13%	8.10%	8.09%	8.08%
Total Dollars (Millions)	$ 90.2	$ 91.1	$ 92.1	$ 90.1	$ 93.1	$ 96.1	$ 99.0
Total Manhours (Millions)	1.439	1.411	1.381	1.309	1.314	1.316	1.316

Table 7. Army C.A.T. Vehicle Workload Distribution

Army C.A.T. Vehicles Workload Distribution
Current Projections

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$640.2	$582.4	$553.2	$520.2	$443.1	$412.6	$381.9
% Total $	96.93%	95.93%	97.11%	97.02%	96.91%	96.64%	96.41%
Contract	$ 18.3	$ 22.1	$ 13.9	$ 13.6	$ 13.4	$ 13.6	$ 13.5
% Total $	2.77%	3.65%	2.43%	2.53%	2.93%	3.19%	3.40%
Interservice	$ 1.9	$ 2.6	$ 2.6	$ 2.4	$ 0.7	$ 0.7	$ 0.7
% Total $	0.29%	0.43%	0.46%	0.45%	0.16%	0.17%	0.18%
Total Dollars (Millions)	$660.5	$607.1	$569.7	$536.2	$457.2	$426.9	$396.1
Total Manhours (Millions)	8.967	7.880	7.179	6.801	5.834	5.419	5.048

Table 7a. Army C.A.T. Heavy Combat Vehicle Workload Distribution

Army C.A.T. Vehicle Workload Distribution
Current Projections
Heavy Combat Only

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$273.1	$228.4	$186.8	$179.5	$166.8	$155.1	$144.3
% Total $	99.60%	99.43%	99.31%	99.34%	99.34%	99.36%	99.31%
Contract	$ 1.1	$ 1.3	$ 1.3	$ 1.2	$ 1.1	$ 1.0	$ 1.0
% Total $	0.40%	0.57%	0.69%	0.66%	0.66%	0.64%	0.69%
Interservice	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Dollars (Millions)	$274.2	$229.7	$188.1	$180.7	$167.9	$156.1	$145.3
Total Manhours (Millions)	3.492	2.865	2.452	2.387	2.224	2.068	1.924

Table 7b. Army C.A.T. Light Combat Vehicle Workload Distribution

ARMY C.A.T. Vehicle Workload Distribution
Current Projections
Light Combat Only

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$176.1	$138.8	$188.2	$188.3	$135.1	$126.2	$117.1
% Total $	99.53%	98.75%	99.26%	99.37%	99.19%	99.14%	99.15%
Contract	$ 0.8	$ 1.8	$ 1.4	$ 1.2	$ 1.1	$ 1.1	$ 1.0
% Total $	0.47%	1.25%	0.74%	0.63%	0.81%	0.86%	0.85%
Interservice	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Dollars (Millions)	$176.9	$140.6	$189.6	$189.5	$136.2	$127.3	$118.1
Total Manhours (Millions)	2.738	1.978	2.19	2.25	1.598	1.485	1.382

Table 7c. Army C.A.T. Artillery Vehicle Workload Distribution

ARMY C.A.T. Vehicle Workload Distribution
Current Projections
Artillery Only

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$ 47.4	$ 69.7	$ 54.3	$ 40.5	$ 37.2	$ 34.5	$ 30.5
% Total $	73.22%	76.59%	80.22%	75.38%	76.25%	74.31%	71.88%
Contract	$ 15.4	$ 18.7	$ 10.8	$ 10.8	$ 10.9	$ 11.2	$ 11.2
% Total $	23.79%	20.55%	15.94%	20.16%	22.24%	24.12%	26.40%
Interservice	$ 1.9	$ 2.6	$ 2.6	$ 2.4	$ 0.7	$ 0.7	$ 0.7
% Total $	3.00%	2.86%	3.84%	4.47%	1.51%	1.57%	1.72%
Total Dollars (Millions)	$ 64.7	$ 91.0	$ 67.7	$ 53.7	$ 48.8	$ 46.4	$ 42.4
Total Manhours (Millions)	0.639	0.919	0.749	0.554	0.512	0.476	0.442

Table 7d. Army C.A.T. Tactical Vehicle Workload Distribution

Army C.A.T. Vehicle Workload Distribution Current Projection Tactical Only	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Organic	$143.6	$145.5	$123.9	$111.9	$104.0	$ 96.8	$ 90.0
% Total $	99.32%	99.74%	99.69%	99.69%	99.69%	99.69%	99.69%
Contract	$ 1.0	$ 0.4	$ 0.4	$ 0.4	$ 0.3	$ 0.3	$ 0.3
% Total $	0.68%	0.26%	0.31%	0.31%	0.31%	0.31%	0.31%
Interservice	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0	$ 0.0
% Total $	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Dollars (Millions)	$144.6	$145.9	$124.3	$112.3	$104.3	$ 97.1	$ 90.3
Total Manhours (Millions)	2.098	2.118	1.788	1.610	1.500	1.390	1.300

(2) The seven depots which this study covers are depicted geographically in figure 1. The currently projected C.A.T. vehicle capacity utilization for each of the depots based upon the projected workload is shown in table 8.

Figure 1. C.A.T. Vehicle Support Depots

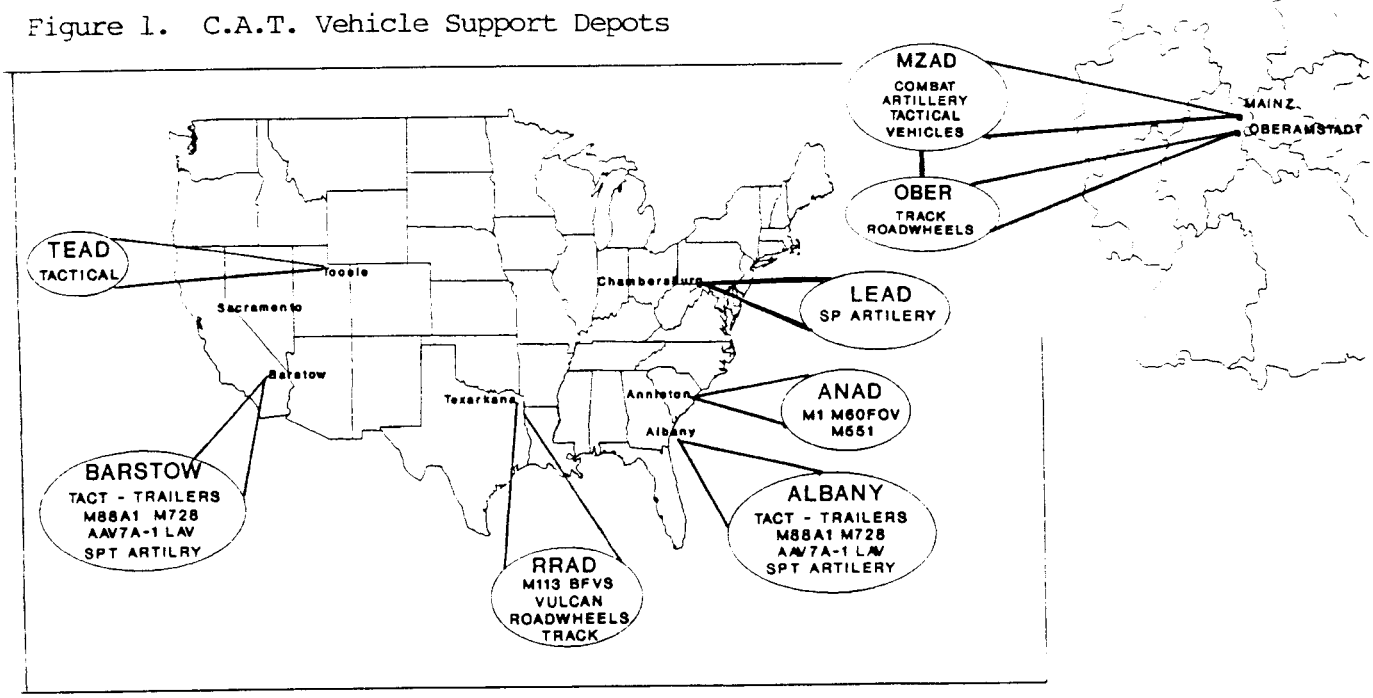


Table 8. C.A.T. Vehicle Capacity Utilization

DEPOT TOTALS	FY91 %UTIL	FY92 %UTIL	FY93 %UTIL	FY94 %UTIL	FY95 %UTIL	FY96 %UTIL	FY97 %UTIL
ANAD	98.6%	81.5%	69.0%	64.1%	59.6%	55.5%	51.6%
RRAD	43.8%	34.3%	39.9%	37.1%	34.5%	32.1%	29.9%
LEAD	45.9%	59.9%	45.4%	42.3%	39.3%	36.5%	34.0%
TEAD	71.9%	74.0%	62.7%	58.3%	54.2%	50.4%	46.9%
MZAD	38.4%	30.4%	29.6%	30.0%	18.1%	16.8%	15.6%
ALBANY	101.5%	106.4%	103.7%	102.5%	102.5%	102.3%	103.3%
BARSTOW	106.6%	109.0%	112.3%	111.2%	113.1%	109.5%	113.4%

e. Maintenance and Support Facilities:

(1) Only the Army and the Marine Corps have depot capacity for repairing C.A.T. equipment. The Navy and the Air Force rely on the U..S. Army Logistics base to repair C.A.T. components.

(2) The following paragraphs provide short descriptions of each depot covered in this study.

(a) Anniston Army Depot, Anniston, AL (ANAD) - Anniston is the sole depot in the Army depot system capable of overhaul/rebuild of the main battle tanks used by the Army, Marine Corps and many allied nations. It is the only DOD facility in CONUS capable of providing the full range of depot support for the M1 Abrams series of tanks. Other major maintenance missions include small arms and missile repair, overhaul of subassemblies, and fabrication of end items and components not accessible through normal supply sources. Other major missions involve the receipt, storage, renovation, demilitarization and shipping of conventional munitions. Anniston also receives, stores, and issues major end items such as tanks, wheeled tactical vehicle and small arms. The Depot's transportation access consists of 28 miles of internal rail network which the Southern Railroad provides direct service to; a major east/west interstate; Anniston City and Birmingham International Airports are within 50 miles (the latter can handle C5A aircraft). The facilities consists of 1,459,148 sqft of maintenance area; 6,525,722 covered and 2,047,987 uncovered sqft of storage area; 2,746,325 sqft of covered ammo storage area. The current workforce comprise 4,385 civilian employees and 44 military personnel (19 officers and 25 enlisted).

(b) Letterkenny Army Depot, Chambersburg, Pennsylvania (LEAD) - Letterkenny is the primary depot for the maintenance and overhaul of the

Army artillery (self propelled and towed) and air defense missile systems (HAWK and Patriot). Ammunition and supply are also part of Letterkenny's mission; to include the receipt, storage, preservation, packing and issue of general supply end items, repair parts, and ammunition. The Depot's transportation access consists of a railhead into the depot and an internal rail network; interstate highways 3 miles to the ease, 20 miles to the south and the Pennsylvania Turnpike 20 miles to the north, and 2 airports, within 50 miles, a C141/C5 airfield at Martinsburg, West Virginia Air National Guard and Harrisburg International. The facilities consists of 907,000 covered and 1,600,000 uncovered sqft of maintenance area; 7,377,000 covered and 3,524,000 uncovered sqft of storage area; 2,935,000 covered and 26,000 uncovered sqft of ammunition storage area. The Depot's installation value is $250,000,000 with a replacement value of $890,000,000 (both costs include plant equipment). The current workforce comprise 3,603 civilian employees and 50 military personnel (16 officers and 34 enlisted). Letterkenny also has tenant activities consisting of approximately 1,400 employees.

(c) Red River Army Depot, Texarkana, Texas (RRAD) - Red River is the only depot in the U.S. Army Depot System Command (DESCOM) with major missions in all 3 areas of depot level support; maintenance, supply and ammunition. Red River is the designated maintenance point for all light combat vehicles, including the Bradley Fighting Vehicle, Multiple Launch Rocket System, M981 Fire Support Team Vehicle and M901A1 Improved Tow Vehicle. As an area oriented depot, Red River is responsible for supplying 7 of 11 active divisions based in the Central U.S., 16 training schools and numerous reserve units. The depot ships and receives more than 250 tons of ammunition daily, and stores approximately $1.7 billion of ammunition in 702 earth-covered igloos located on 9,000 acres. The depot's transportation access consists of 74 miles of internal railway connected to a railhead; Interstate 30 located less than 1 mile to the north; and major civilian and military airfields located within a 175 mile radius (Dallas, Texas, Little Rock, Arkansas and Barksdale Air Force Base, Shrevesport, Louisiana). The facilities consist of 1,341,195 sqft of maintenance area; 784,836 covered and 477,234 uncovered sqft of storage area; 882,000 covered and 149,000 uncovered sqft of ammo storage area. The Depot's installation value is $248,671,969 with a replacement value of $737,484,764 (both costs include plant equipment). The current workforce comprise of 5,500 civilian employees and 43 military personnel (16 officers and 27 enlisted). Red River is centrally located and provides easily attainable support for both tracked and wheeled vehicles, as well as support for aircraft armament.

(d) Tooele Army Depot, Tooele, Utah (TEAD) - Mission is to perform depot level maintenance of components and end items for all types of wheeled vehicle/trailers, military/commercial construction and engineering equipment, power generation equipment, topographical support equipment, missiles, tactical/non-tactical tire recapping, DOD

locomotive/railroad fleet, troop support equipment, depot level supply support, conventional and chemical munition storage and maintenance, design of ammunition peculiar equipment and operation of Army Material Command's (AMC's) largest reserve training program. The Depot's transportation access consists of Union Pacific major east/west - north/south railhead within 30 miles; interstate highway systems east/west, 15 miles, and north/south, 30 miles, and 3 airports, Dugway Proving Grounds, Hill Air Force Base, and Salt Lake International all with C5A capability within 60 miles. The facilities consist of 655,000 sqft of maintenance area; 1,725,000 covered and 5,113,000 uncovered sqft of storage area; 2,578,000 covered and 1,140,000 uncovered sqft of ammo storage area. The Depot's installation value is $198,091,151 with a replacement value of $1,791,893,434 (both costs include plant equipment). The current workforce is comprised of 3,783 civilian employees and 41 military personnel (18 officers and 23 enlisted). In addition, the depot in constructing a new consolidated maintenance facility consisting of 375K sqft at a cost of $111.1M. The facility will provide a $20.1M per year savings and will be complete Jul 92.

(e) Marine Corps Logistics Base, Albany, Georgia (MCLB) - Mission is to manage fielded Marine Corps weapon systems. It receives, stores, maintains, rebuilds and issues supplies and equipment for Marine Corps units. Procures Principle End Items (PEI) and Secondary Depot Repairables (SDR) and spares. Serves as the Marine Corps National Inventory Control Point (NICP). Manages the Marine Corps Logistics Automated Information System and provides technical assistance to Marine Corps Reserve Units east of the Mississippi River. The Base's transportation access consists of excellent rail, interstate, and air service adjacent to facilities. Three deep water ports are within 175 to 212 miles. The facilities consist of 576,000 sqft of maintenance area and 3,500,000 covered and 7,000,000 uncovered sqft of storage area. The base's installation value in $354,000,000 with a replacement value of $1,417,000,000 (both costs include plant equipment). The current workforce is comprised of 2,778 civilian employees and 936 military personnel (131 officers and 805 enlisted).

(f) Marine Corps Logistics Base, Barstow, California (MCLB) - Mission is to receive, store, maintain, rebuild and issue supplies and equipment for Marine Corps West Coast, Mid Pacific, and West Pacific Units. Provides technical assistance to Marine Corps Reserve Units West of the Mississippi River. The Base's transportation access consists of excellent rail, interstate, and air service within 150 to 200 miles. Three deep water ports are within 150 to 180 miles. The facilities consist of 709,000 sqft of maintenance area and 3,101,000 covered and 10,600,000 uncovered sqft of storage area. The Base's installation value is $140,000,000 with a replacement value of $472,000,000 (both costs include plant equipment). The current workforce is comprised of 1,933 civilian employees and 561 military personnel (52 officers and 509 enlisted).

(g) Mainz Army Depot (MZAD), FRG - The U.S. Army Maintenance Plant, Mainz complex is a Government-Owned-Government-Operated (GOGO) facility, under the command and control of the U.S. Army Materiel Command (AMC). As a Major Subordinate Command of AMC, the U.S. Army Depot System Command (DESCOM) exercises command authority concerning MZAD operations. Until 1980, maintenance was mainly performed on tracked & wheeled vehicles. From 1980-present, facilities in Ober-Ramstadt were added and the responsibilities of the contractor were increased to include the repair, overhaul and modification of combat vehicles, automotive, construction equipment, communications electronics, and other equipment in support of the Department of Defense (DOD) activities in Europe. In recent years, staging of new vehicles and equipment has become a MZAD function at locations including Uhlerborn, Friedrechsfeld, and Geinsheim. MZAD currently accomplishes depot-level maintenance of tracked and wheeled vehicles, missile systems, communications and electronics equipment. It refurbishes tires, road wheels, track, and overhauls/repairs major assemblies and components, such as engines, transmissions, and fire control systems. MZAD provides maintenance and supply functions, technical assistance, receipt, storage and issue functions for the hand-off of new equipment in-theater under the Army's Force Modernization Program as well as modification/retrofit of such items. MZAD provides all supplies and services necessary for base support and operations in Germany operated by the contractor; Mainz-Mombach, Mainz-Gonsenheim, Uhlerborn, Geinsheim, Ober-Ramstadt, and Friedrichsfeld. Maintenance of tracked and wheeled vehicles and secondary vehicular components is performed at both Mainz-Mombach and Mainz-Gonsenheim. Ober-Ramstadt refurbishes pneumatic tires, tank tracks, and combat vehicle road wheels. The contractor operated staging mission at MZAD includes the management and operation of all staging operations. Contractor operated staging sites at Friedrichsfeld, Uhlerborn, and Geinsheim handle the staging of all vehicles and non-classified equipment.

f. Equipment. Table 9 lists major C.A.T. test and repair equipment at the six CONUS depots.

Table 9. C.A.T. Vehicles Common Support Equipment

System	Common Equipment	ANAD	LEAD	RRAD	TEAD	ALBANY	BARSTOW
Heavy Combat							
M1 Abrams Tank							
	Eng/Trans Test	X					
	Fire Cont Test	X					
	Ene Item Test	X					
M60 FOV							
	Eng/Trans Test	X				X	X
	Fire Cont Test	X				X	X
	End Item Test	X				X	X
M551/A1							
	Eng/Trans Test	X					
	Fire Cont Test	X					
	End Item Test	X					

Table 9. C.A.T. Vehicles Common Support Equipment (cont'd)

System	Common Equipment	ANAD	LEAD	RRAD	TEAD	ALBANY	BARSTOW
Heavy Combat							
M88A1							
	Eng/Trans Test	X				X	X
	Fire Cont Test	N/A				N/A	N/A
	End Item Test	X				X	X
M728 CEV							
	Eng/Trans Test	X				X	X
	Fire Cont Test	X				X	X
	End Item Test	X				X	X
AVLB							
	Eng/Trans Test	X					
	Fire Cont Test	X					
	End Item Test	X					
AAV7A1							
	Eng/Trans Test					X	X
	Fire Cont Test					X	X
	End Item Test					X	X
Light Combat							
M2/M3 BFVS							
	Eng/Trans Test			X			
	Fire Cont Test			X			
	End Item Test			X			
MLRS							
	Eng/Trans Test			X			
	Fire Cont Test			X			
	End Item Test			X			
M113 FOV (Incl Vulcan/Chap)							
	Eng/Trans Test			X		X	X
	Fire Cont Test			X			
	End Item Test			X		X	X
LAV							
	Eng/Trans Test					X	X
	Fire Cont Test					X	X
	End Item Test					X	X
Artillery							
M109							
	Eng/Trans Test		X	X		X	X
	Fire Cont Test		X	X		X	X
	End Item Test		X	X		X	X

Table 9. C.A.T. Vehicles Common Support Equipment (cont'd)

System	Common Equipment	ANAD	LEAD	RRAD	TEAD	ALBANY	BARSTOW
M110							
	Eng/Trans Test		X	X		X	X
	Fire Cont Test		X	X		X	X
	End Item Test		X	X		X	X
M101							
	Eng/Trans Test		X	X		X	X
	Fire Cont Test		X	X		X	X
	End Item Test		X	X		X	X
M198							
	Fire Cont Test		X	X			X
	End Item Test		X	X			X
M578							
	Eng/Trans Test		X	X		X	X
	End Item Test		X	X		X	X
M102							
	Fire Cont Test		X	X			
	End Item Test		X	X			
M114							
	Fire Cont Test		X	X		X	X
	End Item Test		X	X		X	X
Wheeled Vehicles							
Light							
	Eng/Trans Test				X	X	X
	End Item Test				X	X	X
Medium							
	Eng/Trans Test		X		X	X	X
	End Item Test		X		X	X	X
Heavy							
	Eng/Trans Test		X		X	X	X
	End Item Test		X		X	X	X
Trailers							
	End Item Test		X		X	X	X

g. Technical Support. There are no significant differences in the technical support among the six CONUS depots. All have Computer-Aided Design/Computer-Aided Manufacture (CAD/CAM) technology, all provide a wide variety of field support functions, and all have resident engineering support.

h. Environmental Considerations. Environmental management programs at all six CONUS depots operate all missions and related activities in compliance with State and Federal regulatory requirements.

i. Skills. Shown in table 10 is the current mix of repair skills and direct labor personnel employed at each CONUS depot. All of the depots have been generally successful in acquiring the required number of skilled personnel fromm local labor pools. The study team has concluded that availability of skilled people is not a variable that impacts proposed connsolidations.

Table 10. C.A.T. Vehicle Repair Skills

SKILLS	ANAD	LEAD	RRAD	TEAD	ALBANY	BARSTOW	TOTAL
Heavy Mobile Equip Mec/ Inspect	516	274	381	544	200	261	2175
Machinist/ Inspect	264	69	105	22	24	15	499
Welder/ Inspect	98	118	72	41	13	14	456
Painter/ Inspect	96	49	37	104	39	25	350
Electroplate	23	10	36	5	4	1	79
Sandblaster	53	38	34	12	8	6	151
Electric Mech	0	15	0	0	18	22	56
Optical Inst/ Mech/Insp	77	53	11	0	12	17	171
Electronic Mech/Inspec	62	0	218	0	5	4	289
Artillery Inspect	96	59	0	0	1	1	157
Sheet Metal Inspect	40	45	84	24	38	21	252
Industrial Op	0	0	12	0	0	0	12
Hydraul Sys Mech	28	18	38	0	0	0	84
Ordanance/ Armament	34	0	82	0	0	0	116
Rubber Products Inspect	0	0	94	0	0	0	94
TOTAL	1487	749	1204	752	362	387	4941

3. Efficiencies and Cost Reductions.

a. The study team looked for ways to improve efficiency and reduce costs in the three areas of interservicing, capacity utilization, and competition. This paragraph discusses the team's findings in each area.

b. Interservicing.

(1) Neither the Air Force nor the Navy have depot maintenance capability for C.A.T. vehicles. They do support the field level repair of their C.A.T. assets with components repaired in the Army depot system, but they do not do depot level repair or overhaul of C.A.T. systems.

(2) Most C.A.T. vehicles that are used by more than one service are used by the Army and the Marine Corps. The two Marine Corps depot maintenance activities, MCLB Albany and MCLB Barstow, have small C.A.T. capacities compared to the Army depots and are near 100% capacity utilization. They could not absorb any useful quantity of Army depot maintenance workload.

(3) The Army is, however, providing interservice repair to the Marine Corps. The Marine Corps requisitions $4.6 million of depot level reparables from the Army each year. Beginning in FY 91, the Marine Corps will obtain repair of M1 series combat tank secondary components at Anniston Army Depot. All together this interservice support will total 8% of the total Marine Corps C.A.T. workload.

c. Capacity utilization.

(1) Several Army depots have excess capacity. The study team examined laying away, or mothballing, this excess. The team found that by reducing the number of work positions, and by consolidating and streamlining the remaining positions, all or part of some buildings could be placed in layaway. Laying away these areas would reduce their cost of ownership, e.g. basic maintenance and utilities costs, without irreversibly affecting the capacity of the depots. Because the facilities and equipment in these laid away areas would remain in place, they could be quickly reactivated if needed for mobilization.

(a) Table 11 shows the methodology the study team used to calculate estimated savings that would result from laying away excess capacity:

Table 11. Layaway Savings Plan Savings Methodology

- Plan is to layaway all excess capacity
- Excess capacity is computed by subtracting the funded workload manhours from the total capacity
- Excess capacity is converted into work positions by dividing by 1615 manhours per work position
- Average savings per work position laid away is $1406

(b) Table 12 shows the net savings that the study team estimates would occur in FY 1991 after costs of implementing the layaway were deducted.

Table 12. C.A.T. FY91 Layaway Savings Computation

DEPOT	POSITIONS LAID AWAY	BUILDINGS LAID AWAY	IMPLEMENTATION COSTS	FIRST YEAR SAVINGS
ANAD	83	6	0.026	$.453M
LEAD	317	7	0.385	($.216M)
RRAD	1112	9	1.444	$.034M
TOTAL	1512	22	1.855	$.271M

(c) Table 13 shows the total savings that the study team estimates would occur for the period FY 1991 through FY 1997.

Table 13. C.A.T. Depot Layaway Savings Plan

DEPOT	FY91	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
ANAD	0.045	0.584	0.710	0.774	0.877	1.093	1.238	5.321
RRAD	2.027	2.372	0.403	0.556	1.268	1.432	1.585	9.643
LEAD	0.730	0.542	0.000	0.000	0.000	0.000	0.000	1.271
TEAD	0.000	0.622	0.835	0.998	1.095	1.186	1.270	6.678
TOTAL EXCESS CAPACITY HOURS	2.802	4.120	1.948	2.328	3.241	3.711	4.093	22.913
TOTAL SAVINGS $	.271	3.227	1.525	1.824	2.539	2.907	3.207	14.830

1 WORK POSITION = 1615 HOURS
1 WORK POSITION = $1406
NOTE: DOLLARS AND HOURS IN MILLIONS

(2) Although laying away excess capacity improves capacity utilization and reduces ownership costs, there is a limit to how much capacity it is cost-effective to lay away without ultimately consolidating the remaining workload into fewer depots. Table 14 shows the projected Army C.A.T. depot repair workload as decreasing from 9.175 million direct labor hours in FY 1991 to 5.068 million hours in FY 1997. If all excess capacity resulting from this decrease in workload were laid away, by FY 1997 over 60% of the facilities at ANAD, RRAD, and LEAD would be in layaway. As base operations costs at these depots increase in proportion to direct labor hours, the laying away of capacity would provide diminishing returns.

Table 14. Projected Army C.A.T. Depot Repair Workload

DEPOT	FY91	FY92	FY93	FY94	FY95	FY96	FY97
ANAD	3.134	2.578	2.180	2.027	1.885	1.753	1.631
RRAD	1.582	1.237	1.440	1.339	1.245	1.158	1.077
LEAD	0.819	0.810	0.614	0.571	0.531	0.494	0.459
TEAD	1.718	1.769	1.498	1.393	1.269	1.205	1.121
MZAD	1.922	1.521	1.482	1.502	0.903	0.839	0.780
TOTAL	9.175	7.915	7.214	6.832	5.833	5.449	5.068

(3) Therefore, as total C.A.T. depot repair workload decreases, further cost savings beyond initial layaway should be sought through consolidating the workload from several depots at single locations. The study team evaluated potential consolidations using the methodology shown in table 15. It found that cost effective consolidation could be considered by the transfer of the self-propelled artillery workload now at LEAD to RRAD, and the transfer of all MZAD C.A.T. workload to CONUS depots.

Table 15. Consolidation Methodology

- Existing Capability
- Like Capability, Common Skills
- Candidates for Consolidation Selected for Consideration by Commodity Class
- Proximity to Users
- Cost Savings Potential

(a) Table 16 shows the estimated savings that would result from consolidating LEAD artillery workload at RRAD if additional missile workload were transferred into LEAD following the consolidation. This additional workload would employ capacity made available when the artillery workload left. Unless this or other new workload were transferred into LEAD, the potential savings identified in table 16 would be canceled out by increases in the labor rates for the Hawk Missile repair that would remain at LEAD. The study team nonetheless recommends consolidating the LEAD artillery workload at RRAD because it begins a consolidation process that will be necessary to achieve maximum utilization of facilities as workload diminishes.

Table 16. Estimated Savings to Move Artillery Mission From LEAD to RRAD

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
SAVINGS							
TOTAL	0	0	6.36	6.36	6.36	6.36	6.36
COSTS ($ MILLION)							
CONSTRUCTION	0	0	0	0	0	0	0
MOVE EQUIPMENT/ SUPPLIES	0	0	1.30	0	0	0	0
PESONNEL							
PCS COST	0	0	1.08	0	0	0	0
RIF COST	0	0	1.91	0	0	0	0
TOTAL	0	0	4.29	0	0	0	0
NET SAVINGS ($ MILLION)	0	0	2.07	6.36	6.36	6.36	6.36

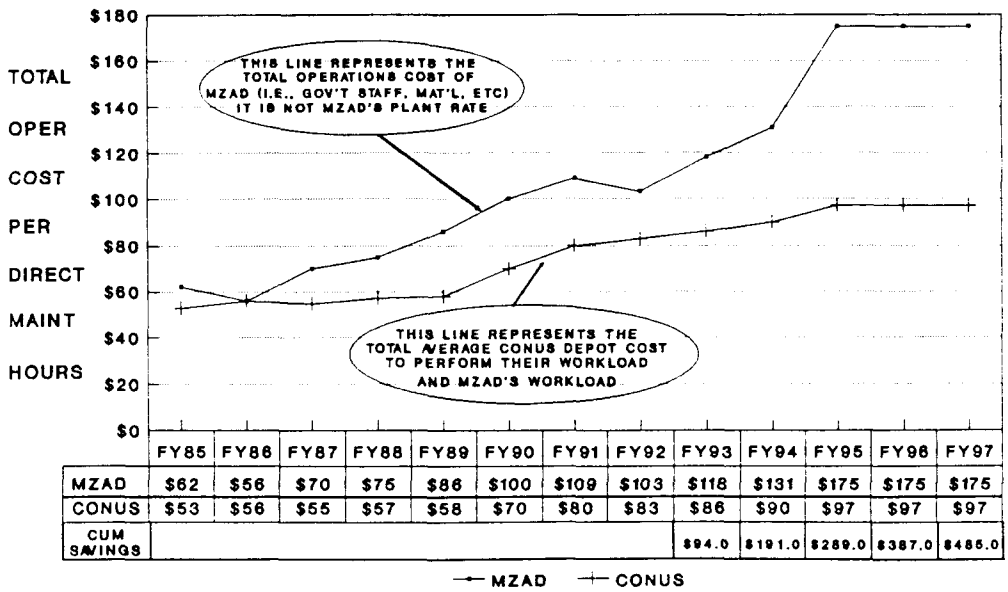
NOTE: Rate change increase at LEAD if tactical missile work is not avaiable to backfill the loss of artillery work will amount to $9.56M per year starting in FY93.

(b) Table 17 shows the MZAD workload redistribution to CONUS depots and table 18 shows the savings resulting from this consolidation. A side benefit of this consolidation is the improved utilization and distribution of overhead rates to direct labor costs.

Table 17. Effect of Redistribution of the MZAD Workload

	FY93			FY94			FY95			FY96			FY97		
	WKLD	CAP	%UTIL	WKLD	CAP	%UTIL	WKLD	CAP	%UTIL	WKLD	CAP	%UTIL	WKLD	CAP	%UTIL
MZAD															
BASELINE	1.482	5.000	26.6%	1.502	5.000	30.0%	0.903	5.000	18.1%	0.839	5.000	16.8%	0.780	5.000	15.6%
ADJUSTED	0.000	0.000	0.0%	0.000	0.000	0.0%	0.000	0.000	0.0%	0.000	0.000	0.0%	0.000	0.000	0.0%
ANAD															
BASELINE	2.180	3.162	69.0%	2.027	3.162	64.1%	1.885	3.162	59.6%	1.753	3.162	55.5%	1.631	3.162	51.6
ADJUSTED	2.452	3.162	77.6%	2.387	3.162	75.5%	2.284	3.162	72.3%	2.068	3.162	65.4%	1.924	3.162	60.8
RRAD															
BASELINE	2.054	3.609	56.9%	1.910	3.609	52.9%	1.776	3.609	49.2%	1.652	3.609	45.8%	1.536	3.609	42.6
ADJUSTED	3.206	3.609	88.8%	3.052	3.609	84.6%	2.340	3.609	64.9%	2.176	3.609	60.3%	2.023	3.609	56.1
TEAD															
BASELINE	1.498	2.391	62.7%	1.393	2.391	58.3%	1.296	2.391	54.2%	1.205	2.391	50.4%	1.121	2.391	46.9
ADJUSTED	1.556	2.391	65.1%	1.393	2.391	58.3%	1.296	2.391	54.2%	1.205	2.391	50.4%	1.120	2.391	46.9

Table 18. Savings Resulting from the MZAD Workload Redistribution



	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97
MZAD	$62	$56	$70	$75	$86	$100	$109	$103	$118	$131	$175	$175	$175
CONUS	$53	$56	$55	$57	$58	$70	$80	$83	$86	$90	$97	$97	$97
CUM SAVINGS									$94.0	$191.0	$289.0	$387.0	$485.0

(MILLIONS)

NOTE: SAVINGS IS BASED UPON MZAD COST PER YEAR MINUS AVERAGE CONUS DEPOT COST TO PERFORM THE SAME WORK

(c) It should be noted that the Defense Business Operation Fund (DBOF) cost methodology was not used in developing the cost savings in consolidating the artillery or MZAD workloads. Further MZAD workload reallocation savings must be viewed as tentative pending approval of the MZAD utilization study directed by Mr. Dausman, Dep Asst Sec for Procurement, HQDA, and a final agreement between CG AMC and CINC USAREUR.

(d) Relocation of the CAT workload from one or both Marine Corps depot maintenance activities, to the Army to increase Army depot capacity utilization was analyzed. The MCLBs are composite logistics planning, Item Management and National Maintenance Point operations, Depot Maintenance Activities (DMA), and soldier training sites. The two Marine Corps Depots are small, modern, well equipped/maintained facilities, geographically located to provide support to the Fleet Marine Force. They are an integral part of the Corps weapon system development/management and logistics support system. Moving the Combat, Artillery and Tactical vehicle workload from Barstow to Albany and Army depots or from Albany and Barstow both to Army depots can be done. It should be noted that the DMA's at Albany and Barstow are affected, and the MCLB's remote storage activity will be affected, and the MCLB's remote storage activity will be affected. This action may eliminate duplication of capability in DOD depots and improve overall capacity utilization. The elimination of Marine Corps DMA's results in the loss of a modern/well-equipped depot maintenance activity. This option has the potential to disrupt Marine Corps logistics linkages and customer-supplier relationships with the operating forces and may result in a base closure. At the MCLB DMA's, 30% of the staff are uniformed military that serve in on-the-job training for 18-24 month rotations. Comparable training sites would be required to support this training need if the MCLB DMA workload is transferred to Army depots. Relocation of workload is not recommended since average billing rates at MCLBs are $10/hour less than average billing rates in Army depots. There is no potential for transfer of depot work from Army to MCLBs as utilization rates are and are expected to remain at or above 100%.

(e) A further aspect of workload consolidation and capacity utilization is typified by the TEAD Consolidated Maintenance Facility (CMF). Department of Defense has recently given final approval for construction of a Consolidated Maintenance Facility at Tooele Army Depot. This will be the most advanced facility for repair of wheeled vehicle in the Department of Defense. The design of this facility utilized state of the art automation from the automated storage and retrieval system to the management and control computer with all systems integrated to help managers and planners make most effective use of limited resources. While the annual cost savings for all commodities/items are projected to be $16.7M starting in FY 1993. The computation methodology and annual cost savings for wheeled vehicle commodities are projected to be $13.4M (table 19).

Table 19. Methodology and Cost Savings CMF

Consolidated Maintenance Facility (CMF)
Tooele Army Depot

Savings Computation
Methodology and Assumptions

- Cost Analysis - FY90 Dollars
  - Personnel Staffing
    - ✓ 970 - Status Quo
    - ✓ 607 - CMF
    - ✓ 363 - Savings
  - Annual Workload - 1.7M Manhours
  - Projected Savings
    - ✓ $16.7M All Commodities
    - ✓ $13.4M Wheeled Vehicles (80%)
    - ✓ $ 3.3M Other Commodities (20%)

(f) The net effect of the capacity utilization analysis is that, mothballing and workload consolidation and redistribution will result in savings of $371.3M in FY 1991 through FY 1995 and will improve depot capacity utilization to 90% or greater at all depots.

c. Competition.

(1) The study team analyzed the C.A.T. vehicle depot repair workload to identify potential benefits from competition.

(a) Industry surveys indicate that savings of 20 to 35 percent of current program costs are possible through competition. A September 1989 Joint Depot Maintenance Advisory Group (JDMAG) study, Depot Maintenance Workload Test, supports these surveys. It estimates that competition could produce 21 to 28 percent savings. To estimate the savings that could be generated by competing repair the study team used a conservative 20% savings rate.

(b) Senior Army management examined the depot core workload determination process. The result is that Equipment Readiness Codes (ERC) are being proposed as selection criteria for determining core workload. Using this rule, any equipment item identified as ERC "A" or "P" on the TOE requires core support. ERC "B" or less, would not be core support items. Using this determination guide and the directions in AR 220-1, the study team determined that only tactical vehicles could be considered for non-core support. Pending a detailed review of TO&Es, the study team estimated that 20% of the tactical vehicles are ERC "B" or "C" items. Because the U.S. Army repairs secondary items for these vehicles at depot, by extension of logic, the study team determined that 20% of the tactical vehicle secondary item depot repair program was candidate for competition. It should be noted that this potential competition is envisioned between public/public and public/private entities. Using the percentage from para (a) above, (20% savings), the workload estimates in table 7d, and the 20% estimate of ERC "B" assets, approximately $18.2M can be saved in FY 1991 - FY 1995. Additionally $9.1M can be saved in FY 1996 - FY 1997. Table 20 below shows the computation.

Table 20. Savings Resulting From Competition

COMPETITION SAVINGS

COMPUTATION:

$ 22.80	TACTICAL VEHICLE WORKLOAD IN SUPPORT OF ERC "B" AND "C"
X .20 %	SAVINGS RATE PROJECTEDN FROM COMPETITION
$ 4.56 M	YEARLY SAVINGS

TOTAL SAVINGS FY92-FY97: $4.56 X 6 = $27.36 M

3. Conclusions. The conclusions of the study team are that implementing the actions analyzed in this study will save $371.62M FY 1991 - FY 1995 and $250.75M in FY 1996 - FY 1997. The results of the analysis portray a series of options that are not easily implemented and require forceful implementation and perseverance to achieve the calculated savings. In summary:

a. Interservicing among all services will not cause savings reportable in this study. The Marine corps will interservice its M1 Abrams tank depot repair with the Army. However, no further increase in interservicing is practical. The Air Force and the Navy have no depot repair capability for C.A.T. vehicles and retain interservice with the Army. The Marine Corp C.A.T. vehicle depot repair capability is small, and cannot effectively absorb enough of the large Army workload to meaningfully change interservicing.

b. Capacity utilization can be enhanced by layaways and workload consolidation. Substantial excess capacity exists in Army depots. By consolidating and streamlining the operations, all or part of some buildings can be placed in layaway. Laying away excess capacity would save $9.39M for the period FY 1991 through FY 1995 and $6.11M for the period FY 1996 through FY 1997. C.A.T. depot repair workload will decrease over the coming years and further cost savings beyond initial layaway should be sought through consolidating the workload from several depots at single locations. Cost-effective consolidation of the self-propelled artillery workload now at LEAD to RRAD and reallocation of the MZAD workload to CONUS depots will increase capacity utilization and begin a process of consolidation that will become necessary as C.A.T. depot repair workload diminishes. Savings projected for this consolidation total $303.79M for the period FY 1991 through FY 1995 and $208.72M for the period FY 1996 through FY 1997. Finally, the planned Combined Maintenance Facility (CMF) at TEAD will consolidate the depot repair of tactical vehicles at one location for a projected total savings of $40.2M for the period FY 1991 through 1995, and $26.8M for the period FY 1996 through FY 1997.

c. Competition of non-core tactical vehicle secondary items, if restrictions on competing depot repair workload between the public and private sectors were removed, will save a total of $18.24M for the period FY 1991 through FY 1995; and an additional $9.12M for the period FY 1996 through FY 1997.

4. Recommendations.

a. This study recommends that the following actions be taken:

(1) Lay away excess depot capacity at ANAD, RRAD and TEAD.

(2) Consolidate self-propelled artillery depot repair by moving the self-propelled artillery work now being done at LEAD to RRAD and redistribute the MZAD C.A.T. workload to CONUS depots.

(3) Abolish restrictions on competing depot-level repair, and compete above-core workload.

(4) Maximize use of CMF at TEAD.

b. The projected C.A.T. vehicle capacity utilization of each of the seven depots studied is estimated to be as follows if all of the actions which the study team recommended were implemented:

Table 21. Capacity Utilization as a Result of Implementing the Study

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Albany	101.5	106.4	103.7	102.5	102.5	102.3	103.3
ANAD	98.0	90.0	90.0	90.0	90.0	90.0	90.0
Barstow	106.6	109.0	112.3	111.2	113.1	109.5	113.4
LEAD	90.0	90.0	0.0	0.0	0.0	0.0	0.0
RRAD	90.0	90.0	90.0	90.0	90.0	90.0	90.0
TEAD	90.0	90.0	90.0	90.0	90.0	90.0	90.0
MZAD	38.4	30.4	0.0	0.0	0.0	0.0	0.0

Note that the above figures show only C.A.T. vehicle capacity utilization. All of the depots also have capacity for repair of other items which this study does not cover.

7. The study team projects the following total savings (table 22) to result from all recommended actions for the period FY 1991 through FY 1995, and for the additional period FY 1996 through FY 1997:

Table 22. Total Savings Resulting from Implementing the Study

TOTAL SAVINGS BREAKOUT
(YEARLY SAVINGS)

CAPACITY UTILIZATION	FY91	FY92	FY93	FY94	FY95	FY96	FY97
• LAYAWAY	.27	3.23	1.52	1.83	2.54	2.91	3.20
• CONSOLIDATION (LEAD TO RRAD)	0	0	2.07	6.36	6.36	6.36	6.36
(MZAD TO CONUS)			94.00	97.00	98.00	98.00	98.00
• TEAD CMF	0	0	13.40	13.40	13.40	13.40	13.40
CAPACITY SUB-TOTAL	.27	3.23	110.99	118.59	120.30	120.69	120.96
COMPETITION	0	4.56	4.56	4.56	4.56	4.56	4.56
INTERSERVICING	0	0	0	0	0	0	0
TOTAL	.27	7.79	115.55	123.15	124.86	125.23	125.52

d. Graphs and charts displaying the savings are in Appendix A.

APPENDIX A

The tables in this appendix portray the results of the actions recommended by this study team. The tables are as follows:

Table A-1 This table categorizes the efficiencies and cost reductions that the recommended actions would achieve.

Table A-2 This map shows the depot workload distribution that would result from the recommended actions.

Table A-3 This table portrays the total cost savings that would result from implementing the recommended actions from FY 1991 through FY 1997.

Table A-4 This table shows the FY 1991 projected capacity utilization of each of the depots examined in the study that would result from the recommended actions being implemented.

Table A-5 This table shows projected capacity utilization for FY 1992.

Table A-6 This table shows projected capacity utilization for FY 1993.

Table A-7 This table shows projected capacity utilization for FY 1994.

Table A-8 This table shows projected capacity utilization for FY 1995.

Table A-9 This table shows projected capacity utilization for FY 1996.

Table A-10 This table shows projected capacity utilization for FY 1997.

APPENDIX B

Weapon System Matrix

Table B-1 Consolidated Maintenance Facilities

Table B-2 Competition Public/Private

Table B-3 Layaway

Table B-4 Consolidation Workload/Sp Arty

Table B-5 Consolidation Workload/MZAD Combat

Table A-1

EFFECT OF OPTIONS 1, 2 AND 3

ITEM/SYSTEM	DEPOT 100% UT	CONSOLIDATE	DOWN SIZING	INTER-SERVICE	PUBLIC/ PRIVATE
M1 ABRAMS	ANAD	NO	Y-ANAD	USMC	N/A
M60 FOV	ANAD	NO	Y-ANAD	USMC	N/A
M551A1	ANAD	NO	Y-ANAD	N/A	N/A
M88A1	ANAD	NO	Y-ANAD	NO	N/A
	USMC-1	NO	NO	NO	N/A
CEV	ANAD	YES	Y-ANAD	N/A	N/A
AVLB	ANAD	YES	Y-ANAD	USMC	N/A
AAV7A1 FOV	USMC-A	NO	NO	N/A	N/A
	USMC-B				
BFVS	RRAD	NO	Y-RRAD	N/A	N/A
MLRS	RRAD	NO	NO	N/A	N/A
M113 FOV	RRAD	NO	Y-RRAD	USAF	N/A
LAV FOV	USMC-A	NO	NO	N/A	N/A
	USMC-B				
M109	RRAD	YES	Y-LEAD	NO	N/A
	USMC-A	NO	NO	NO	N/A
	USMC-B	NO	NO	NO	N/A
M110	RRAD	YES	Y-LEAD	NO	N/A
	RIA				
	USMC-A	NO	NO	NO	N/A
	USMC-B	NO	NO	NO	N/A
M578	RRAD	YES	Y-LEAD	NO	N/A
	USMC-A	NO	NO	NO	N/A
	USMC-B	NO	NO	NO	N/A
M101	USMC	YES	Y-LEAD	USA	N/A
M102	RRAD	YES	Y-LEAD	N/A	N/A
M119	RRAD	YES	Y-LEAD	N/A	N/A
M198	USMC-B	YES	Y-LEAD	USA	N/A
M114	USMC-A	YES	Y-LEAD	USA	N/A
	USMC-B				N/A
LIGHT TAC VEH					
END ITEM	USMC	NO	NO	N/A	NO
	TEAD-3	YES	Y-LEAD	N/A	YES-2
SECONDARY	TEAD	YES	Y-LEAD	USAF,USN	YES-2
ITEM	USMC-4	NO	NO	N/A	N/A
MEDIUM TAC VEH					
END ITEM	USMC	NO	NO	NO	NO
	TEAD-3	YES	Y-LEAD	USAF,USN	YES
SECONDARY	TEAD	YES	Y-LEAD	USAF,USN	YES-2
ITEM	USMC-4	NO	NO	N/A	N/A
HEAVY TAC VEH					
END ITEM	USMC	NO	NO	NO	NO
	TEAD-3	YES	Y-LEAD	NO	YES-2
SECONDARY	TEAD	YES	Y-LEAD	NO	YES-2
ITEM	USMC-4	NO	NO	NO	NO

NOTE: 1. USMC retains M88 depot repair capability as element of core logistics.

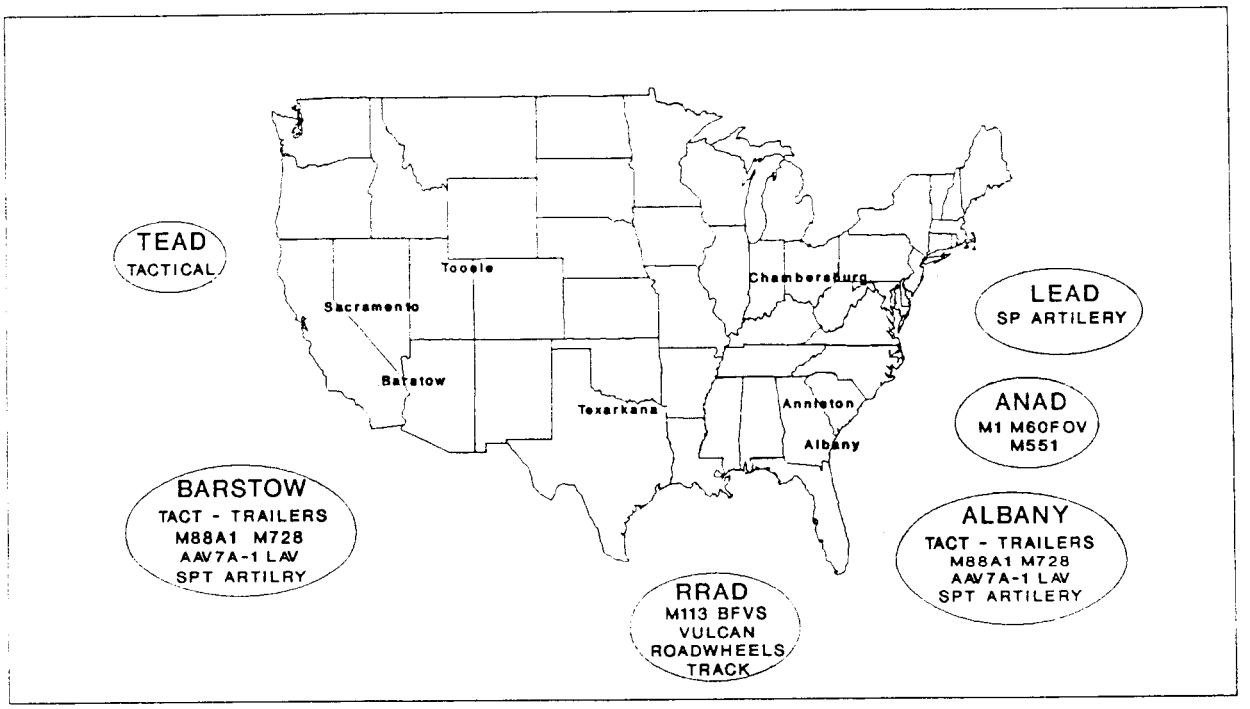
2. Depot repair of secondary items for this equipment may be competed if "Core Logistics" definition is changed.

3. USMC retains end item tactical vehicle repair mission. MCLB-A and -B are at capacity, therefore TEAD must absorb all tactical end item repair for AA, RC, NGB.

4. USMC level of repair of secondary item for tactical vehicles is less than 5% MH annually; therefore, considering level of effort and transport cost, it is deemed appropriate for the USMC to retain the current S.I. level of effort.

Table A-2

PROPOSED C. A. T. VEHICLE DEPOT MAINTENANCE DISTRIBUTION



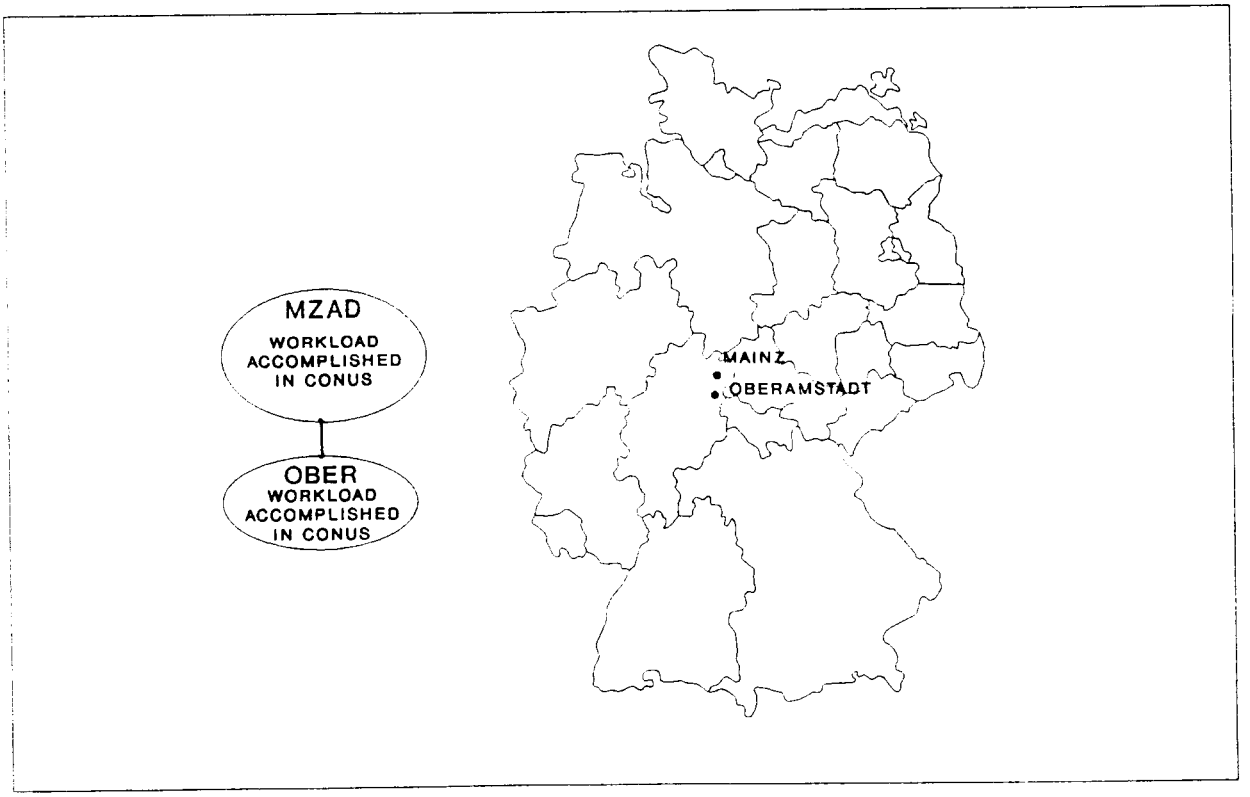


Table A-3

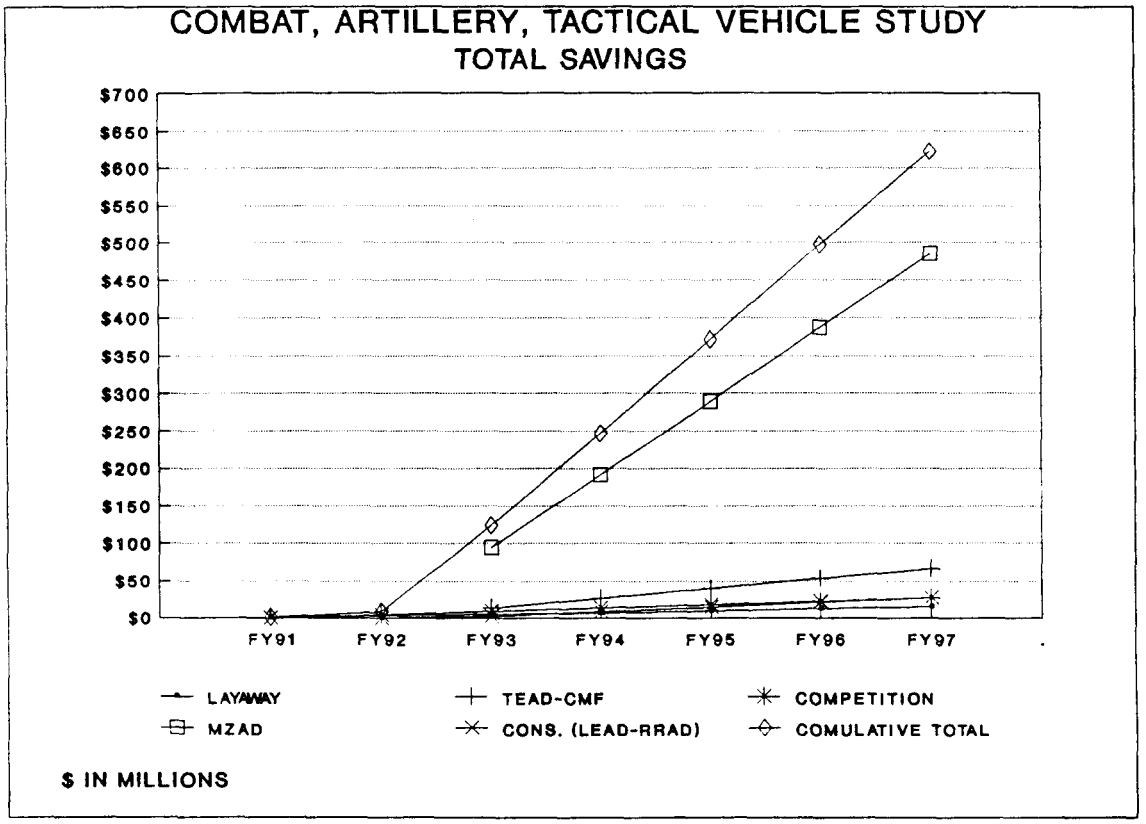

COMBAT, ARTILLERY, TACTICAL VEHICLE STUDY
TOTAL SAVINGS
$700
$650
$600
$550
$500
$450
$400
$350
$300
$250
$200
$150
$100
$50
$0
FY91
FY92
FY93
FY94
FY95
FY96
FY97
LAYAWAY
TEAD-CMF
COMPETITION
MZAD
CONS. (LEAD-RRAD)
COMULATIVE TOTAL
$ IN MILLIONS

Table A-4

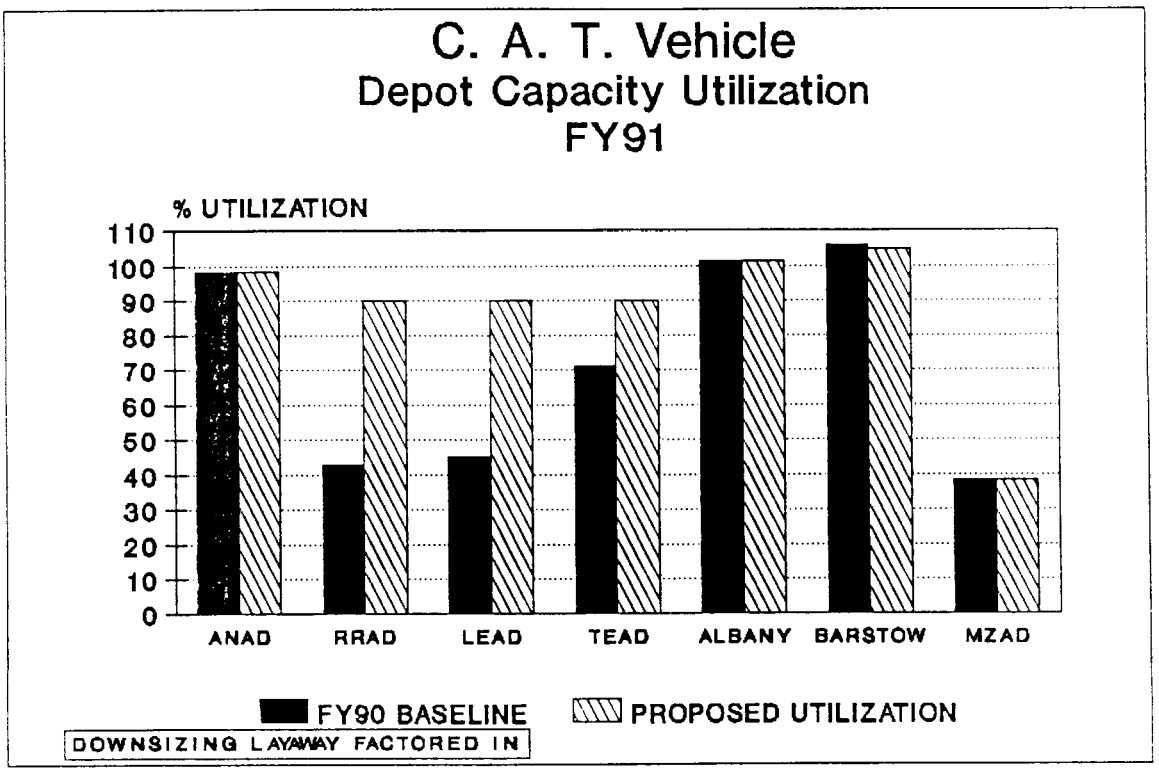


Table A-5

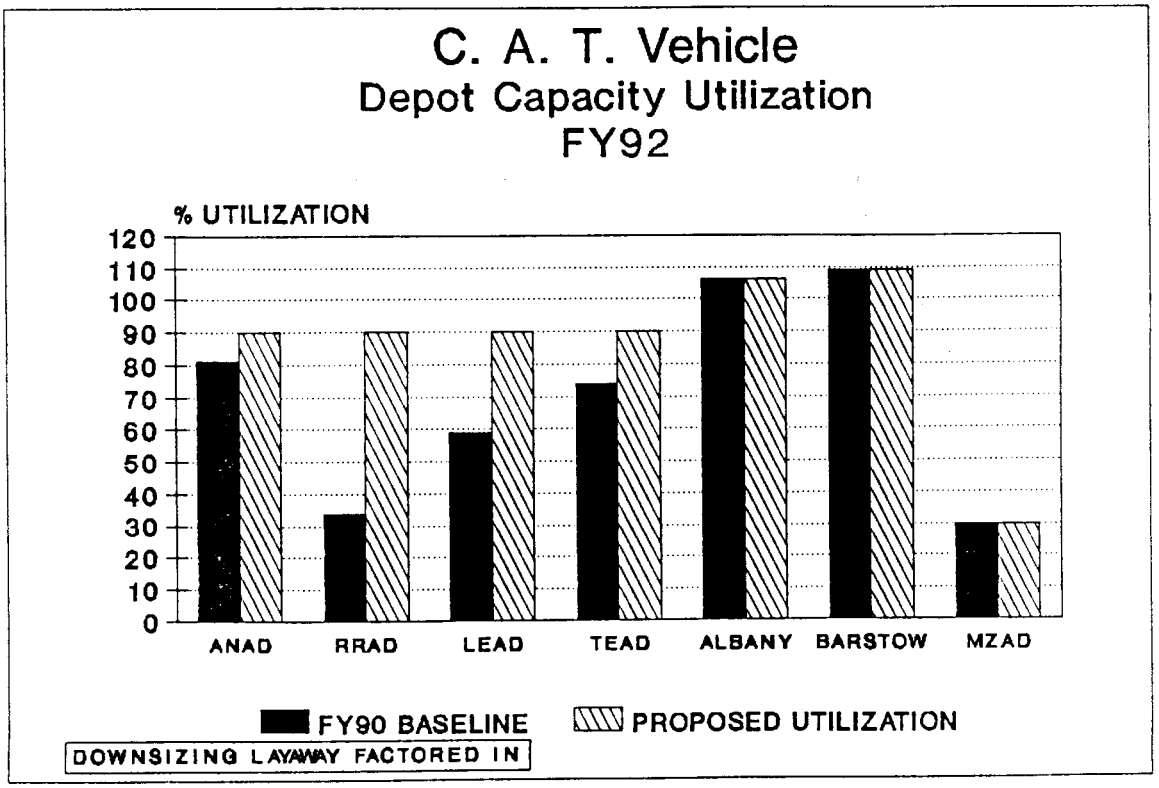
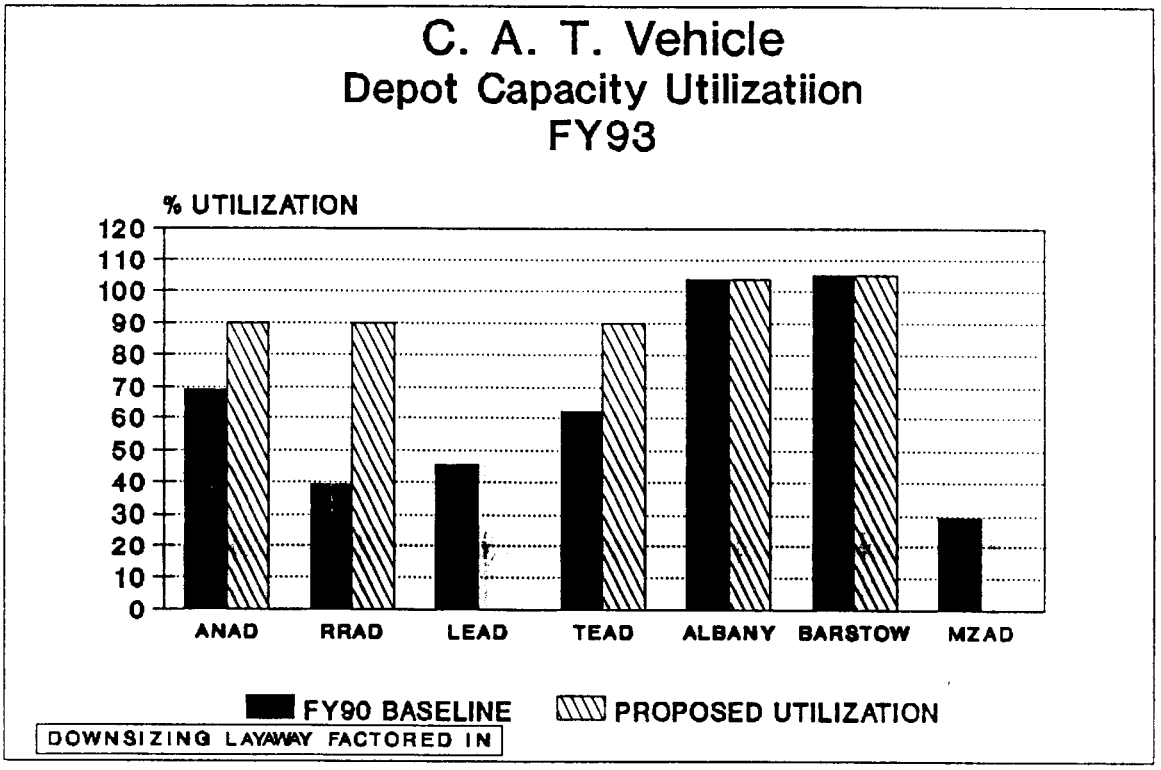


Table A-6



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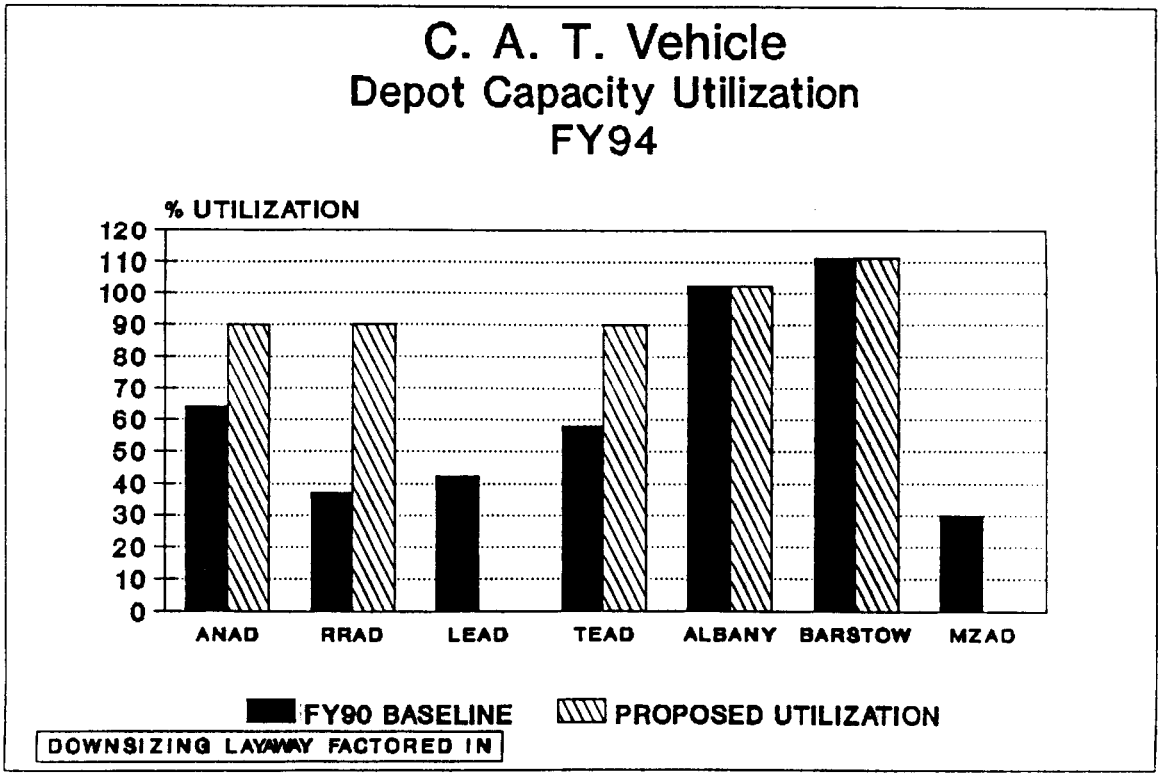


Table A-8

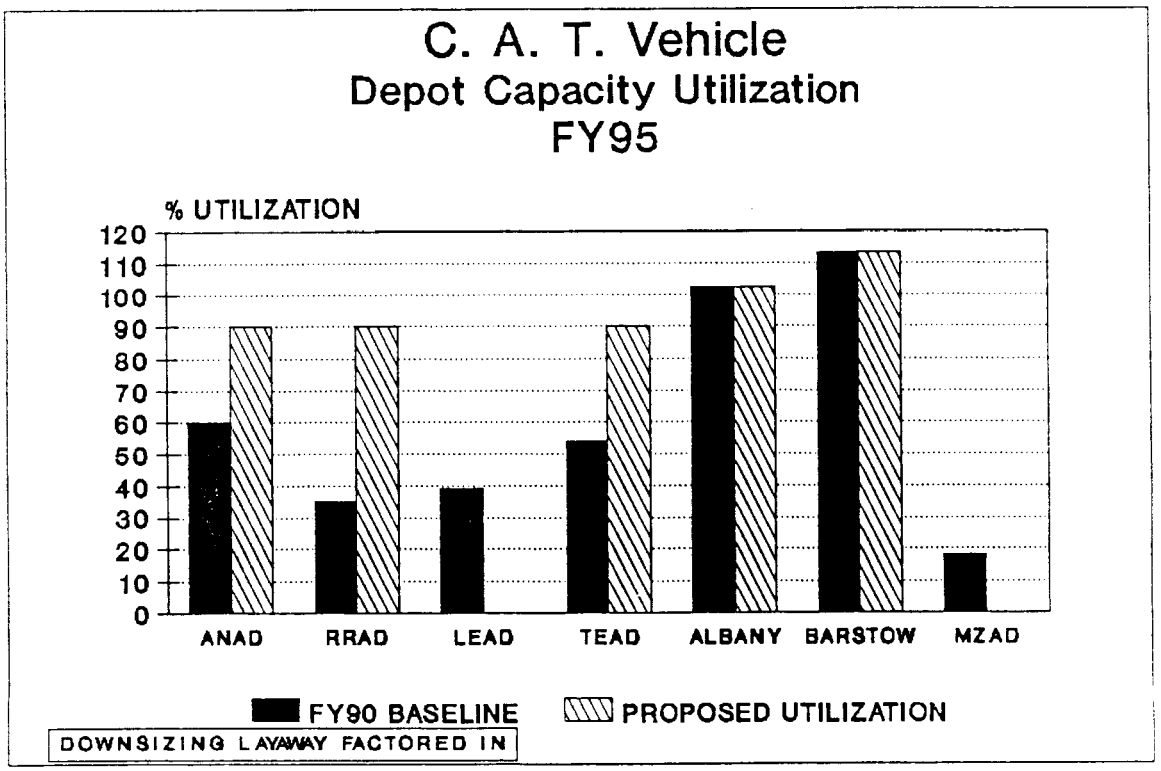


Table A-9

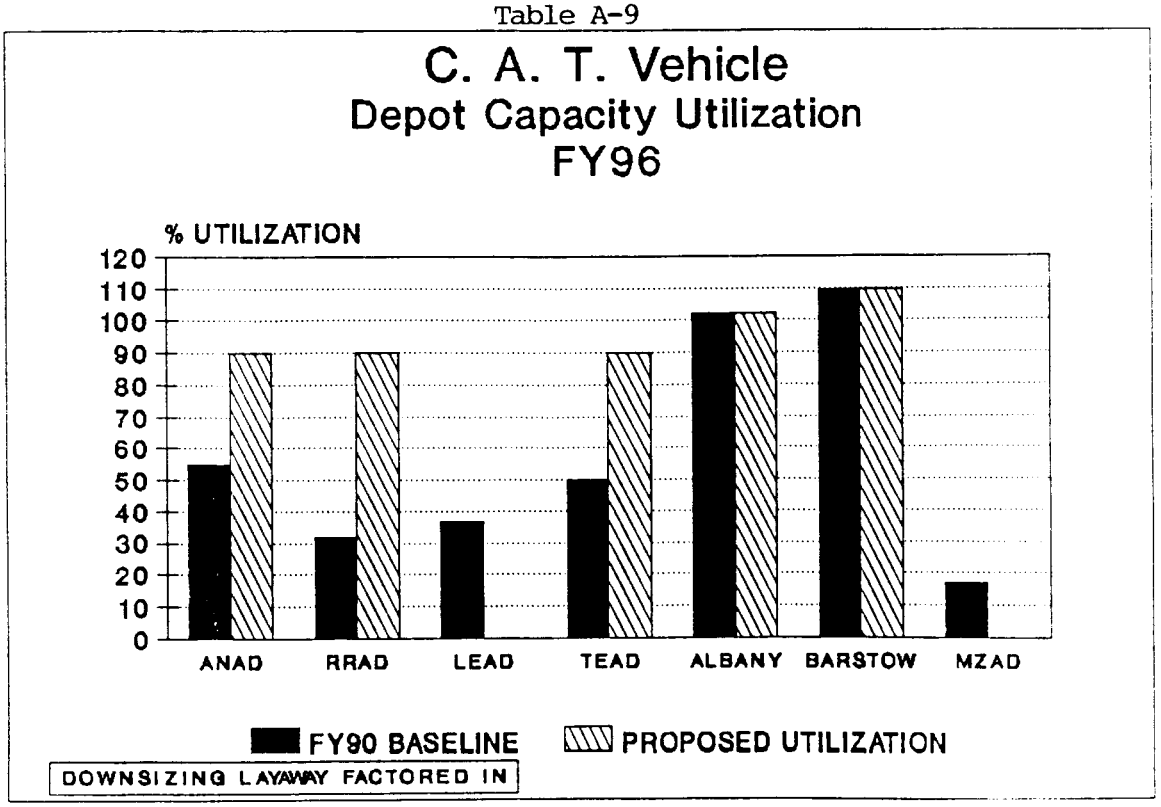
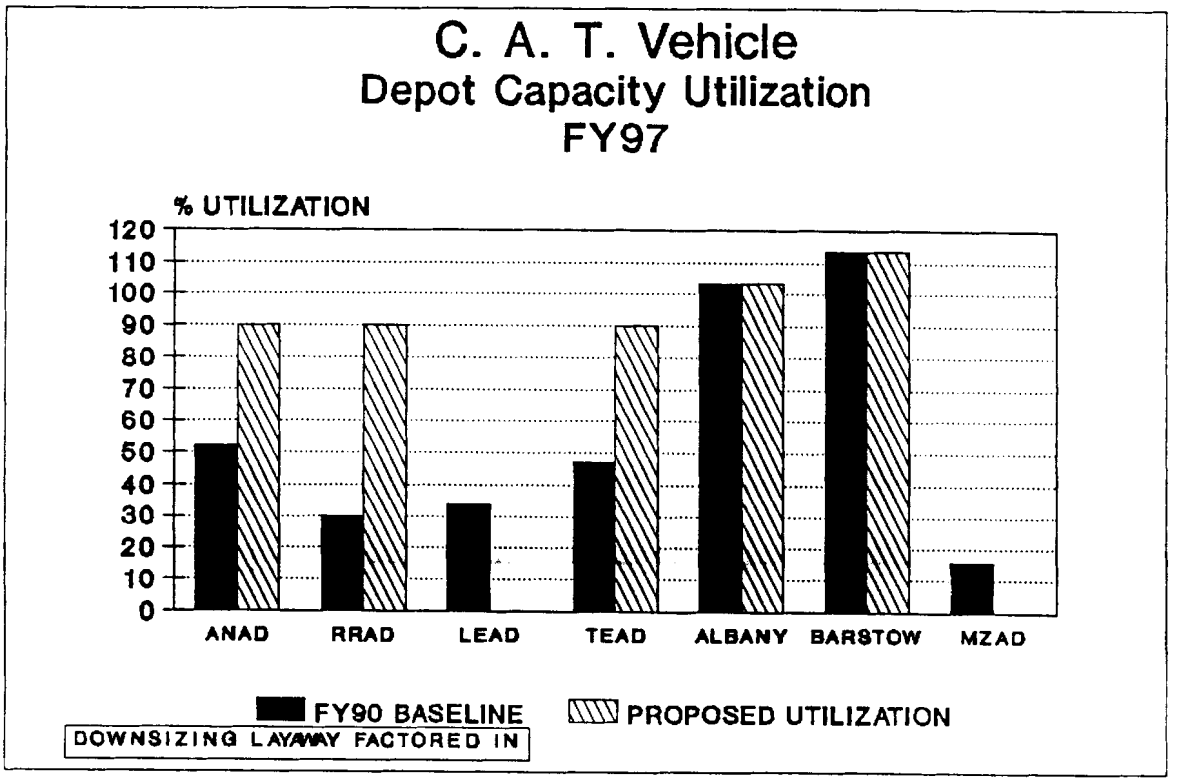


Table A-10


C. A. T. Vehicle
Depot Capacity Utilization
FY97
% UTILIZATION
120
110
100
90
80
70
60
50
40
30
20
10
0
ANAD
RRAD
LEAD
TEAD
ALBANY
BARSTOW
MZAD
FY90 BASELINE
PROPOSED UTILIZATION
DOWNSIZING LAYAWAY FACTORED IN

WEAPON SYSTEM MATRIX

SOR ACTION

CONSOLIDATED MAINTENANCE FACILITY

ITEM NO. _____

A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD (L)	NON-CORE (NC) CORE (C) ABOVE CORE (AC)	UNITS YEAR	SOR	ANNUAL WORKLOAD	ANNUAL BUSINESS BASE	CONS, I/S OR P/PCS DECISION PS - FY P/PC - FY	PROJECTED COST & SAVINGS (INFLATION FACTOR INCORP)						ARMY
								SERVICE	91	92	93	94	95	TOTAL
								COST OF ACTION						
TACTICAL V LIGHT, MED HEAVY	A (L)	C,AC	NA	TO	1400.0	99.860	CONUS 93		--	--	.44	.91	--	1.35
PRIOR TOTAL					1400.0	99.860		GROSS SAVINGS						
									--	--	15.0	16.5	15.8	47.05
								NET SAVINGS						
NEW TOTAL				TO	800.0	85.260			--	--	14.6	15.2	15.9	45.70

WORKLOAD AND CAPACITY DATA

J	K					L				
SOR	WORKLOAD CHANGE (DLH-K)					CAPACITY CHANGE (DLH-K)				
	91	92	93	94	95	91	92	93	94	95
TO	--	--	(600.0)	(600.0)	(600.0)	--	--	(600.0)	(600.0)	(600.0)

Table B-1

WEAPON SYSTEM MATRIX

SOR ACTION
COMPETITON

ITEM NO. _____

A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD (L)	NON-CORE (NC) CORE (C) ABOVE CORE (AC)	UNITS YEAR	SOR	ANNUAL WORKLOAD	ANNUAL BUSINESS BASE	CONS, I/S OR P/PCS DECISION PS - FY P/PC - FY	PROJECTED COST & SAVINGS (INFLATION FACTOR INCORP) ARMY						
								SERVICE	91	92	93	94	95	TOTAL
TACTICAL ALL	A (L)	AC	NA	TO	340.0	22.800	P/PC 92	COST OF ACTION						
									N/A					
PRIOR TOTAL					340.0	22.800		GROSS SAVINGS						
									N/A	4.75	4.97	5.18	5.40	20.3
								NET SAVINGS						
NEW TOTAL				99	340.0	18.240				4.75	4.97	5.18	5.40	20.3

WORKLOAD AND CAPACITY DATA

J	K					L				
SOR	WORKLOAD CHANGE (DLH-K)					CAPACITY CHANGE (DLH-K)				
	91	92	93	94	95	91	92	93	94	95
TO		(340.0)	(340.0)	(340.0)	(340.0)	N/A				
99		340.0	340.0	340.0	340.0					

REMARKS:

WORKLOAD CHANGE DEPENDENT ON RESULTS OF PRIVATE / PC COMPETITION

Table B-2

WEAPON SYSTEM MATRIX

SOR ACTION
LAYAWAY

ITEM NO. _____

A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS YEAR	E SOR	F ANNUAL WORKLOAD	G ANNUAL BUSINESS BASE	H CONS, I/S OR P/PCS DECISION PS - FY P/PC - FY
ALL C.A.T SYS'S	A (L)	C,AC	NA	TOTAL	NA	NA	CONUS 93
PRIOR TOTAL				AI			
				LK			
				RE			
				TO			
NEW TOTAL							

I — PROJECTED COST & SAVINGS (INFLATION FACTOR INCORP) — ARMY

SERVICE	91	92	93	94	95	TOTAL
COST OF ACTION						
	1.85	--	--	--	--	1.85
GROSS SAVINGS						
	2.13	3.36	1.66	2.07	3.00	12.23
NET SAVINGS						
	.271	3.36	1.66	2.07	3.00	10.37

WORKLOAD AND CAPACITY DATA

J SOR	K WORKLOAD CHANGE (DLH-K)					L CAPACITY CHANGE (DLH-K)				
	91	92	93	94	95	91	92	93	94	95
A1	NA	--	--	--	--	0	(600.0)	(700.0)	(800.0)	(900.0)
LK	NA	--	--	--	--	(700.0)	(500.0)	0	0	0
RE	NA	--	--	--	--	(2000.0)	(2400.0)	(400.0)	(600.0)	(1300.0)
TO	NA	--	--	--	--	(700.0)	(600.0)	(800.0)	(1000.0)	(1100.0)

Table B-3

WEAPON SYSTEM MATRIX

SOR ACTION
CONSOLIDATION WORKLOAD

ITEM NO. _____

A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS YEAR	E SOR	F ANNUAL WORKLOAD	G ANNUAL BUSINESS BASE	H CONS, I/S OR P/PCS DECISION PS - FY P/PC - FY
SP ARTY	A (L)	C	NA	LK	460.0	33.600	CONUS 93
PRIOR TOTAL					460.0	33.600	
NEW TOTAL				RE	460.0	27.240	

I — PROJECTED COST & SAVINGS (INFLATION FACTOR INCORP) — ARMY

SERVICE	91	92	93	94	95	TOTAL
COST OF ACTION						
MOVE EQ PCS COST RIF COST	--	--	4.67	--	--	4.67
GROSS SAVINGS						
	--	--	6.93	7.23	7.54	21.7
NET SAVINGS						
	--	--	2.26	7.23	7.54	17.03

WORKLOAD AND CAPACITY DATA

J SOR	K WORKLOAD CHANGE (DLH-K)					L CAPACITY CHANGE (DLH-K)				
	91	92	93	94	95	91	92	93	94	95
RE	--	--	460.0	460.0	460.0	N/A				
LK	--	--	(460.0)	(460.0)	(460.0)					

Table B-4

WEAPON SYSTEM MATRIX

SOR ACTION
CONSOLIDATION WORKLOAD

ITEM NO. _____

A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD (L)	NON-CORE (NC) CORE (C) ABOVE CORE (AC)	UNITS YEAR	SOR	ANNUAL WORKLOAD	ANNUAL BUSINESS BASE	CONS, I/S OR P/PCS DECISION PS - FY P/PC - FY	PROJECTED COST & SAVINGS (INFLATION FACTOR INCORP) ARMY						
								SERVICE	91	92	93	94	95	TOTAL
								COST OF ACTION						
MZAD COMBAT	A (L)	C	NA	MZ	1000.0	93.660	CONUS 93	sev pay			21.4			21.4
								rif cost						
PRIOR TOTAL					1000.0	93.660		GROSS SAVINGS						
											115.4	97.0	98.0	310.9
				TO	20.0	3.600		NET SAVINGS						
				AI	180.0	28.260								
NEW TOTAL				RE	800.0	61.800					94.0	97.0	98.0	289.0

WORKLOAD AND CAPACITY DATA

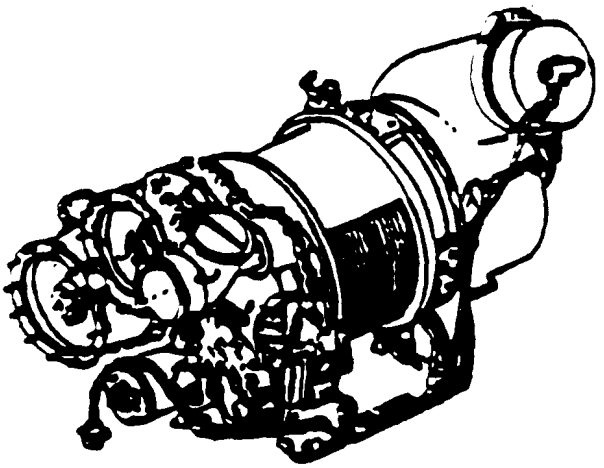
J	K					L				
SOR	WORKLOAD CHANGE (DLH-K)					CAPACITY CHANGE (DLH-K)				
	91	92	93	94	95	91	92	93	94	95
MZ			(1000.0)	(1000.0)	(1000.0)					
AI			180.0	200.0	200.0	N/A				
RE			800.0	800.0	800.0	N/A				
TO			20.0	0	0					

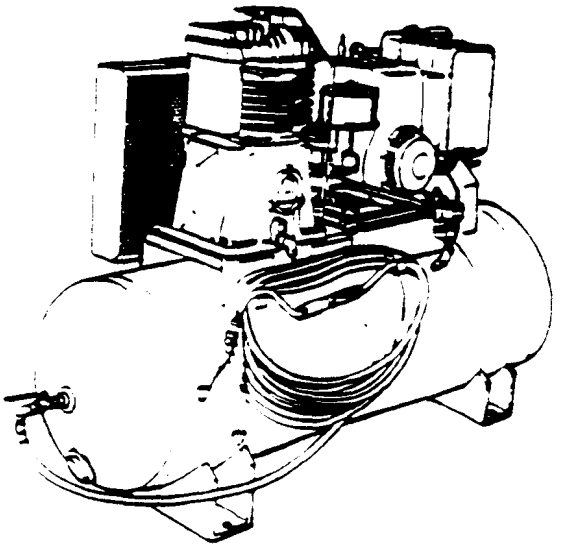
Table B-5

DEFENSE DEPOT MAINTENANCE COUNCIL

STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

GAS TURBINE ENGINES AND COMPRESSORS DEPOT MAINTENANCE STUDY





Prepared for:

DEFENSE DEPOT MAINTENANCE COUNCIL

31 January 1991

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Gas Turbine Engines and Compressors
Depot Maintenance Study

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EXECUTIVE SUMMARY

GAS TURBINE ENGINE AND COMPRESSOR

DEPOT MAINTENANCE STUDY

1. References:

a. Memorandum, Deputy Secretary of Defense, 30 June 1990, subject: Strengthening Depot Maintenance Activities.

b. Memorandum, Office of the Assistant Secretary of Defense for Production and Logistics, 8 August 1990, subject: Defense Depot Maintenance Council Meeting Minutes, 24 July 1990.

c. Headquarters, U.S. Army Materiel Command, Maintenance Division tasking during VENUS televideo conference, 26 July 1990.

2. As requested by above references, a multi-service study team was formed to examine existing Department of Defense (DOD) depot maintenance capabilities for ground support gas turbine engines and compressors. The team examined and analyzed methods to reduce the cost of depot maintenance for these items of equipment for fiscal years (FY) 91 through FY 95 by increasing interservice workload consolidation, increased utilization of depot capacity, and increased competition. The team has recommended actions to reduce depot maintenance cost, and has quantified the total predicated savings that would result from these actions for FY 91 through FY 95. The team has also looked at the long range effects of its recommendations through FY 96 and FY 97, but has identified these separately from the FY 91 through FY 95 savings. The Defense Resources Operation Fund (DBOF) cost methodology was not utilized in this study.

3. The study team is composed of representatives from U.S. Army Troop Support Command (TROSCOM), U.S. Army Depot Systems Command (DESCOM), San Antonio Air Logistics Center (SA-ALC), Naval Aviation Depot (NADEP) Cherry Point, AND Tooele Army Depot (TEAD). The team is chaired by TROSCOM. The study group convened at HQ TROSCOM on 14-15 August 1990, made site visits to SA-ALC and TEAD, and collected data from each of the service activities included in the study. The activities are SA-ALC, NADEP Cherry Point, TEAD, NADEP Alameda, Warner Robins Air Logistic Center (WR-ALC), and Ogden Air Logistics Center (OO-ALC). The data collected is the basis for this study.

4. Following the site visits, the study group reviewed and analyzed the data (workload, capacity, facilities, and other relevant data) which had been collected for each service activity. The study group consensus is as follows:

a. The types and models of ground support gas turbine engines included in the study are of similar technologies which require minimum unique depot capability. The total workload for ground support gas turbine engines is less than the total available depot capacity. The majority of the capacity and capability is at SA-ALC and the smallest capacity is at TEAD. Accordingly, ground support gas turbine engine workload at TEAD should be consolidated at SA-ALC. The consolidation would increase capacity utilization at SA-ALC and may provide opportunities for productivity gains due to SA-ALC's resident gas turbine engine staff and technological base. The relocation will also maintain the prime depot concept and allow TEAD to rededicate their efforts as the Center of Technological Expertise (CTX) for gas and diesel engines. The reposturing should be phased over a two-year period (FY91-92) and coincide with the relocation of TEAD'S workload into their new Consolidated Maintenance Facility (CMF) in FY92.

b. The study group was unable to determine if additional consolidation could be accomplished due to the limited scope of the study, which included ground support gas turbine engines, but excluded the "on-board"/airborne gas turbine engines. The workload at SA-ALC, NADEP Cherry Point, and NADEP Alameda is a mixed population of both gas turbine engines which are repaired in the same facilities. It was determined that the other study groups for the large aircraft gas turbine engines has encountered similar problems due to the fragmentation of the various gas turbine studies. Future studies should be consolidated to obtain the maximum in efficiencies and cost savings when considering consolidations of gas turbine engine workloads/depots.

c. The compressor workload is currently consolidated at TEAD and a contractor. The study proposed no change at this time. However, prior to the expiration of the contract, the compressor workload should be reviewed to determine the best source of repair for the contract workload. The compressor workload at TEAD is primarily for the Air Force Minutemen Missile silos and was considered to be "core" depot maintenance.

5. The savings associated with the consolidation of the gas turbine engines is through increased capacity utilization. The study group was unable to identify any cost effective shift of workload to increase current interservicing percentages or realize additional cost savings through increased competition. The projected gas turbine capacity utilization of the four depots studied is estimated to be as follows if the study recommendations were implemented:

	FY92	FY93	FY94	FY95	FY96	FY97
SA-ALC	41	44	41	41	41	41
NADEP Cherry Point	15	15	15	15	15	15
NADEP Alameda	12	12	12	12	12	12
TEAD	46	0	0	0	0	0

The capacity utilization figures for FY 91 are not displayed because of the surge requirements. The above figures reflect only the utilization of that capacity allocated to the ground support gas turbine engines covered in this study. All of the depots except TEAD have additional "on-board"/airborne gas turbine engine workload which, if included in this study, would show higher depot capacity utilization rates.

6. Capacity utilization rates for compressors were not included in this study. TEAD, the only organic depot source of repair for compressors, has no dedicated work area for the small workload. The small compressor workload has no impact on depot capacity utilization.

7. Savings associated with the consolidation of the TEAD gas turbine engine workload at SA-ALC is $0.720M from FY 1993 through FY 1997. The savings are based on reductions in manpower (6 spaces) at TEAD. A one time cost (estimated at $0.240M in FY 1993) will be incurred to move special tools and test equipment from TEAD to SA-ALC. The impact on personnel is minimal and their skills can be utilized on other equipment commodities worked at TEAD. The study team projects the following total savings to be gained as a result from all recommended actions for the period FY 1992 through FY 1995, and for the additional period FY 1996 through 1997:

($'s in Millions)

	FY92	FY93	FY94	FY95	FY96	FY97
Consolidate TEAD gas turbine engines at SA-ALC	0.000	0.192	0.192	0.192	0.192	0.192
Yearly total savings	0.000	-0.048	0.192	0.192	0.192	0.192
Total FY92 - FY95			0.336			
Total FY96 - FY97						0.384

The negative cost savings displayed in FY 93 reflects the transfer of the equipment and special tools from TEAD to SA-ALC.

WAYNE A. PRALLE
Army
Chairman

JERRY KLAR
Air Force
Team Member

BOBBY JEFFERSON
Navy
Team Member

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

GAS TURBINE ENGINES AND COMPRESSORS

1. Study Methodology:

a. Scope.

(1) This study analyzes DOD depot maintenance capacity and workload for certain gas turbine engines and compressors used by the Ai: Force, Army, Marine Corps, and Navy. It examines ways to reduce the co: of depot level maintenance over fiscal years (FY) 91 through FY 97 by increasing interservice workload consolidation, increased utilization c depot capacity, and increased competition. It recommends actions to reduce depot level maintenance cost and quantifies the total predicted savings that would result from these actions for FY 91 through FY 95. also predicts the long range effects of its recommendations through FY and FY 97, but identifies these separately from the FY 91 through FY 95 savings.

(2) The gas turbine engines included in this study are compone of gas turbine engine powered ground support equipment and excluded airborne gas turbine engines. The compressors included in this study stand alone end item air producing compressors and excluded compressor: that were components of end items.

b. Study Assumptions.

(1) Excluded from the study were all items coded as non-depot level repairable.

(2) Non-related systems are not included (i.e., airborne equipment).

(3) Systems not fielded/fleet inventory are not included.

(4) CONUS/OCONUS systems considered.

(5) Funding for consolidation a given.

(6) DMI decisions are valid/implemented.

(7) System peculiar test/shop equipment will transfer.

(8) Any transfer of workload will be completed by FY 93.

c. Study Group Members.

Name	Assignment	Organization		Phone (DSN)
Mr. Wayne Pralle	Chairman	Army	TROSCOM	693-9413
Mr. Jerry Klar	Principal	Air Force	SA-ALC	945-3416
Mr. Bobby Jefferson	Principal	Navy	NADEP-CP	582-7016
Mr. Kevin Schnitzer	Member	Air Force	SA-ALC	945-4031
Mr. Blain Withers	Member	Army	TEAD	790-3145
Mr. Ken Sherman	Member	Army	DESCOM	570-9961
Mr. Don Roberts	Member	Army	TACOM	786-7410

d. Site Visits.

(1) The study group held its initial meeting on 14-15 August 1990, at U.S. Army Troop Support Command (TROSCOM), St. Louis, Missouri During this meeting, the team members established contacts and develope study methodology. The study group chairman and team members, independently or as groups, visited the following sites during the cour of the study to collect data/information on workload, facilities, equipment, and skills; Tooele Army Depot (TEAD), Tooele, Utah; San Anto Air Logistics Center (SA-ALC), Kelly Air Force Base, San Antonio, Texas Naval Aviation Depot (NADEP), Alameda, California; and NADEP Cherry Poi North Carolina. All of the sites are sources of repair for the gas turbine engines. TEAD, in addition to the gas turbine engines, i sc the only organic source of repair for air compressors.

(2) Also during the study, various team members attended meet: at their service Headquarters or joint service meetings to present stu updates or obtain additional guidance.

e. Data Collection. The team obtained and examined data from numerous sources. The data consisted of gas turbine engine and compre service inventories, depot level maintenance requirements from the services five year planning documents, depot capabilities/capacities, previous depot maintenance consolidation studies. The team reviewed current and planned contract maintenance for the equipment and current Depot Maintenance Interservice Support Agreements (DMISAs). In additi team members obtained data from other on going DDMC study groups such the Joint Logistics Commanders (JLC)/Joint Policy Coordinating Group - Depot Maintenance (JPCG-DM) capacity study group and the Air Force cos comparability study group. The team members also reviewed the Deputy Secretary of Defense memorandum of 30 June 1990, subject: Strengtheni Depot Maintenance Activities; the 8 August 1990 DDMC meeting minutes; previous Defense Management Record Decisions (DMRD) pertaining to depo level maintenance.

2. Analysis.

a. Introduction: The study team organized and analyzed the collected gas turbine engine and compressor data to develop a profile of the current status, to identify the potentials for savings from increased competition, increased capacity utilization, and increased interservicing to determine opportunities for potential savings. To accomplish this effort the team categorized the gas turbine engines and compressors, and compared performing maintenance depot facilities, equipment, skills, technical support, environmental considerations, and workloads.

b. Categories of equipment. The study team categorized the gas turbine engines and air compressors included in the study as follows:

(1) Gas Turbine Engines. The gas turbine engines included in the study were divided into two categories based on their application. The majority of the gas turbine engines were used in Aviation Ground Power Units (AGPU), commonly called "start carts/ground carts", which provide power for fixed and rotary wing aircraft on flight lines. All of the services utilize various configurations of AGPU's to support their aircraft. All of the services program depot level maintenance for the AGPU's, except the Marine Corps, which is supported through the Navy. The remainder of the gas turbine engines are used in unique end item applications for the Army (i.e., power generator sets/power plants). Table 1 lists the gas turbine engines which were included in the study. Table 1A depicts the depot locations for the gas turbine engines.

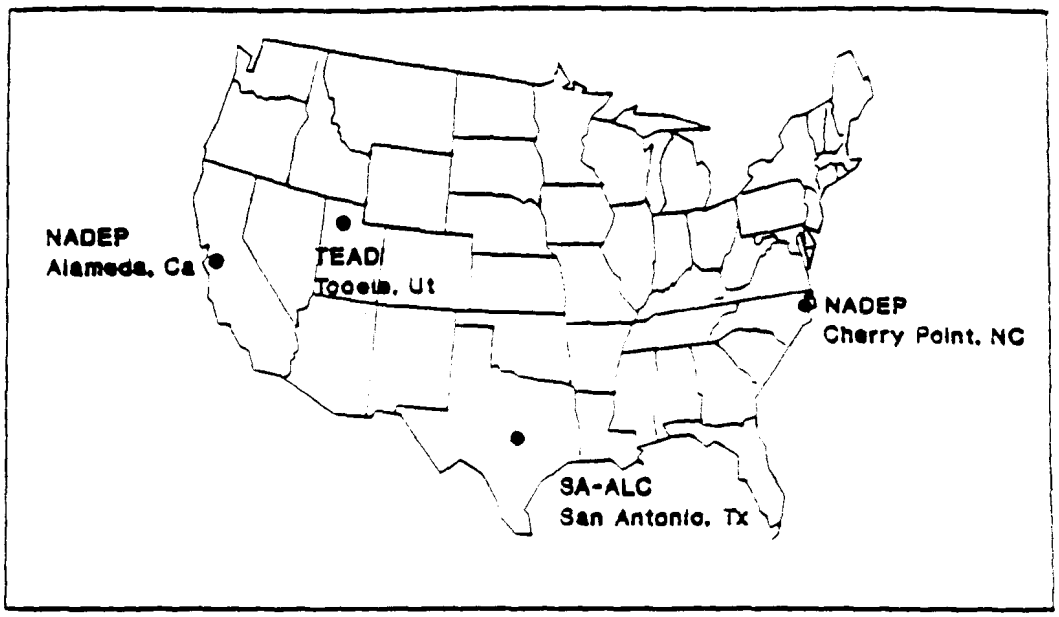
Table 1

Gas Turbine Engines

Name	Mission	Service	Depot Facility	Prime Contractor
GTC85-70A	MA-1AGC	Air Force	SA-ALC	Garrett
GTCP85-180	M32A-60GC	Air Force	SA-ALC	Garrett
GTCP85-180C	M32A-95GC	Air Force	SA-ALC	Garrett
GTCP85-397	M32A-60GC	Air Force	SA-ALC	Garrett
T62T-32	EMU-30	Air Force	Alameda	Solar
D424	150KW GEN	Army	TEAD	Allison
GTCP85-127	MUST PP	Army	TEAD	Garrett
TT-10	10KW GEN	Army	TEAD	Tiernay
GTCP36-50	AGPU	Army	Contract	Garrett
GTC85-72	MD3S	Navy	SA-ALC	Garrett
GTCP-100-82	NCPP-105	Navy	Cherry Point	Garrett

Table 1A

Current Gas Turbine Engine
Depot Maintenance Distribution



(2) Compressors. The compressors included in the study were determined to be the types and configurations that produce air for vari applications. The Air Force and the Army program depot level maintenar for compressors. The study team divided the compressors into two categories. The majority of the air compressors were of the low volume and moderate pressure (expressed in cubic feet per minute (CFM) and pou per square inch (PSI)) types used in maintenance shops, construction, a general purpose applications. The balance of the compressors were designed and procured for mission requirements which require specific unique volumes and pressures. Table 2 lists the compressors included the study. Table 2A depicts the depot location for air compressors.

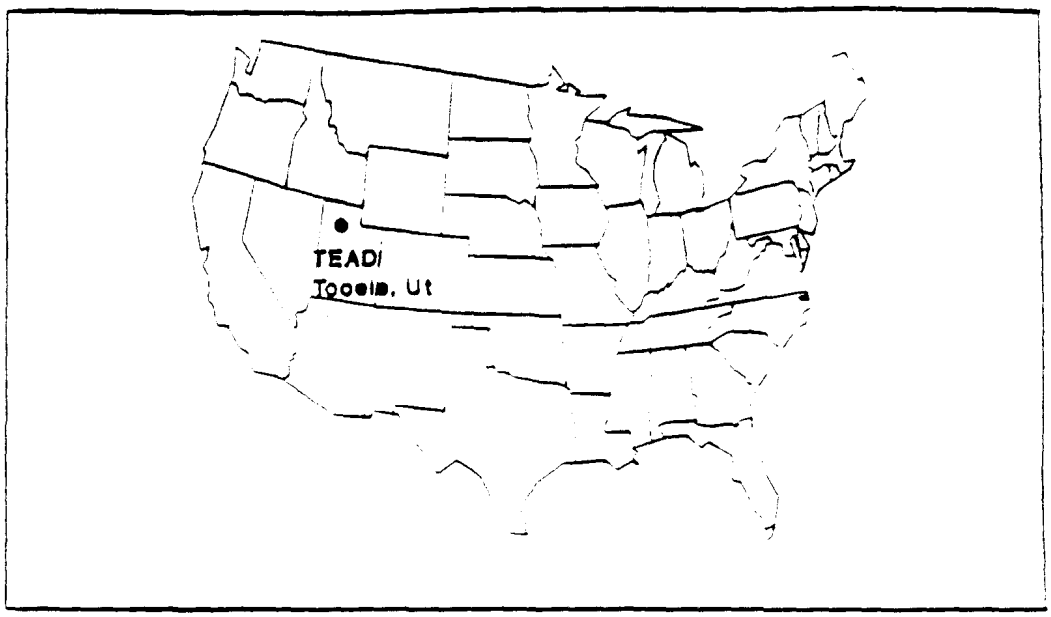
Table 2

Air Compressors

Name	Mission (CFM/PSI)	Service	Depot Facility	Prime Contractor
E32A	3/400	Air Force	Contract	Various
MB-1	15/3500	Air Force	Contract	Various
MB-2	15/200	Air Force	Contract	Various
MB-6	30/200	Air Force	Contract	Various
MC-1A	15/3500	Air Force	Contract	Various
MC-2A	15/200	Air Force	Contract	Various
MC-5	250/100	Air Force	Contract	Various
MC-7	125/100	Air Force	Contract	Various
MC-11	15/4000	Air Force	Contract	Various
MMU	5/175	Army	TEAD	Various
WS133	2/3000	Air Force	TEAD	Stewart

Table 2A

Current Air Compressor
Depot Maintenance Distribution



(3) The study team reviewed current DMISAs for gas turbine engines and compressors. Table 3 lists the current DMISAs for gas turbi engines and compressors for all services. For each DMISA the table identifies the agent or maintenance manager (the organization responsibi for executing the workload specified in the DMISA), the principle user (the customer of the DMISA), and the source of repair. Table 4 lists th non-DMISA depot level workload for gas turbine engines and compressors. None of the items included in this study have a dual source of repair. The Army managed AGPU gas turbine engine (GTCP36-50), listed in table 4 is contractor supported pending completion of the Depot Maintenance Wor Requirement (DMWR) scheduled in FY 91. TEAD has been designated as the source of repair when the DMWR is completed. The percent of workload t is planned to be interserviced by each service for FY 91 through FY 97 shown in tables 5 through 9 and further explained in paragraph 2d.

Table 3

Depot Maintenance Inter-Service Support Agreement
(DMISA) Workload

Weapon System	Agent Maintenance Manager	Principal User	Source of Repair
Gas Turbine Engines			
T62T-32	Navy	Air Force	Alameda
GTC85-72	Air Force	Navy	SA-ALC
Air Compressors			
WS133	Army	Air Force	TEAD

Table 4

Non-DMISA Workload

Workload	Location of Depot Maintenance
Gas Turbine Engines	
GTC85-70A	SA-ALC
GTCP85-180	SA-ALC
GTCP85-180C	SA-ALC
GTCP85-397	SA-ALC
D424	TEAD
GTCP85-127	TEAD
TT-10	TEAD
GTCP36-50	Garrett/TEAD
GTCP100-82	Cherry Point
Air Compressors	
E32A	Saxon Corp.
MB-1	Saxon Corp.
MB-2	Saxon Corp.
MB-8	Saxon Corp.
MC-1A	Saxon Corp.
MC-2A	Saxon Corp.
MC-5	Saxon Corp.
MC-7	Saxon Corp.
MC-11	Saxon Corp.
MMU	TEAD

c. Workload analysis.

(1) The initial process used by the study team in analyzing ga turbine engine and compressor workload was an evaluation of all current planned depot level maintenance. The planned gas turbine engine worklo for FY 91 through FY 97 is displayed by service in tables 5, 6, and 7. The Marine Corps requirements are included in the Navy workload. The planned compressor workload for FY 91 through FY 97 is displayed in tab 8 and 9 for the Air Force and Army. No depot level maintenance is plan for compressors by the Marine Corps and Navy. Each table stratifies th service's total workload requirement into organic, contract, or interservice categories. The table's also include the total cost and total direct manhour requirements for each service's workload.

(2) The workload for gas turbine engines/compressors consist depot level maintenance requirements generated by the military service The gas turbine engine workload also includes Foreign Military Sales (requirements which are less than one percent (1%) of the total workloa The gas turbine engine and compressor depot level maintenance is perfo at organic depots and contractor facilities. Where outyear workload w not available, the study team used straight line projections. The stu team based the decline in outyear workload for gas turbine engines on projected reductions in flying hours or operating tempo for aircraft supported by the AGPU's.

(a) Gas Turbine Engines. The study team had difficulty in comparing gas turbine engine workload with total existing capacity . The narrow range of gas turbine engines assigned to the study team excluded other significant workload directly related to capacity determinations. The gas turbine engine workload at NADEP Alameda, NADEP Cherry Point, and SA-ALC is a percentage of the total gas turbine engine workload accomplished at each activity. The ground support and "on-board"/airborne gas turbine engines are workloaded in the same facilities utilizing the same equipment and personnel. In the support/back shops, such as painting, metalwork, and cleaning, the total ground support gas turbine engine workload was less than 1 man-year of effort. These small elements of workload were not clearly definable to accurately determine capacity utilization of the performing activities. Because of these difficulties in measuring capacity utilization, the percentages listed in this study should be considered to be approximate rather than exact.

Table 5

Air Force Gas Turbine Engine Workload Distribution
Current Projections

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	SM	%	SM	%	SM	%	SM	%	SM	%	SM	%	SM
Organic	87.4	24.2	82.2	16.7	83.0	16.6	81.5	16.7	83.5	16.5	83.5	16.5	83.5	16.5
Contract		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Inter-Service	12.6	3.5	17.8	3.4	17.0	3.4	18.2	3.5	16.2	3.0	16.2	3.0	16.2	3.0
Total S	27.7		19.1		20.0		19.2		18.5		18.5		18.5	
Total Manhours (000's)	355.5		238.3		250.3		231.0		225.1		225.1		225.1	

Table 6

Navy Gas Turbine Engine Workload Distribution
Current Projections

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
Organic	38.3	3.3	38.3	3.3	38.3	3.3	38.3	3.3	38.3	3.3	38.3	3.3	38.3	3.3
Contract		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Inter-Service	61.2	5.2	61.2	5.2	61.2	5.2	61.2	5.2	61.2	5.2	61.2	5.2	61.2	5.2
Total $	8.5		8.5		8.5		8.5		8.5		8.5		8.5	
Total Manhours (000's)	117.0		117.0		117.0		117.0		117.0		117.0		117.0	

Table 7

Army Gas Turbine Engine Workload Distribution
Current Projections

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
Organic	87.0	2.0	85.0	1.7	100.0	1.8	100.0	1.8	100.0	1.8	100.0	1.8	100.0	1.8
Contract	13.0	0.3	15.0	0.3		0.0		0.0		0.0		0.0		0.0
Inter-Service		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Total $	2.3		2.0		1.8		1.8		1.8		1.8		1.8	
Total Manhours (000's)	13.2		16.8		13.8		13.8		13.8		13.8		13.8	

The current projected gas turbine engine capacity utilization for the four depots performing maintenance, based on the workload displayed in tables 5, 6, and 7, is reflected below.

	FY92	FY93	FY94	FY95	FY96	FY97
SA-ALC	41	42	39	39	39	39
NADEP Cherry Point	15	15	15	15	15	15
NADEP Alameda	12	12	12	12	12	12
TEAD	46	39	39	39	39	39

The capacity utilization figures for FY 91 are not displayed because of the surge requirements.

(b) Compressors. Depot level maintenance requirements for compressors are programed by the Air Force and Army. These requirements are not significant drivers for depot workload and has no impact on depot capacity and utilization. TEAD is the only organic depot for compressor workload and has no dedicated facility for performing this workload. The contract workload programed by the Air Force is a multi-year contract awarded in September 1990. Because of the small compressor workload this study contains no capacity utilization for compressors.

Table 8

Air Force Compressor Workload Distribution

Current Projections

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
Organic		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Contract	62.5	0.5	50.0	0.4	50.0	0.4	50.0	0.4	50.0	0.4	50.0	0.4	50.0	0.4
Inter-Service	37.5	0.3	50.0	0.4	50.0	0.4	50.0	0.4	50.0	0.4	50.0	0.4	50.0	0.4
Total $	0.8		0.8		0.8		0.8		0.8		0.8		0.8	
Total Manhours (000's)	13.9		12.7		12.7		12.7		12.7		12.7		12.7	

Table 9

Army Compressor Workload Distribution
Current Projections

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
Organic	100.0	0.1	100.0	0.1	100.0	0.1	100.0	0.1	100.0	0.1	100.0	0.1	100.0	0.1
Contract		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Inter-Service		0.0		0.0		0.0		0.0		0.0		0.0		0.0
Total $	0.1		0.1		0.1		0.1		0.1		0.1		0.1	
Total Manhours (000's)	1.5		1.5		1.5		1.5		1.5		1.5		1.5	

d. Maintenance and Support Facilities.

(1) The study team reviewed all the services facilities due determine the capability at each source of repair. Table 10 list the basic facilities required to perform and support depot level maintenance on the gas turbine engines and compressors. A "x" in table 10 indicates that the depot has an existing facility available.

Table 10

Gas Turbine Engines
Maintenance and Support Facilities
(X = Facilities Available)

Facilities	SA-ALC	TEAD	NADEP Cherry Point	NADEP Alameda
Shipping/Receiving	X	X	X	X
Disassembly/Assembly	X	X	X	X
Clean/Blast	X	X	X	X
Inspect/NDI	X	X	X	X
Metal Processing	X	X	X	X
Heat Treating	X	X	X	X
Foundry	X			
Bearing Reconditioning	X		X	
Electrical Shop	X	X	X	X
Tank and Radiator	X	X	X	X
Vane and Blade/Rotor			X	
Rubber Shop	X	X	X	X
Pneumatics/Hydraulics	X	X	X	X
Balancing Static/Centrifugal	X	X	X	X
Test Cells	X	X	X	X

(2) The following paragraphs describe current or planned specialized capabilities at each of these depots.

(a) TEAD. The Consolidated Maintenance Facility (CMF) unde: construction at TEAD is scheduled to be operational in late FY 92. The facility will consolidate 12 existing maintenance shops and provide for a workload capability/capacity of approximately 2.5 (mil) man-hours on a 1-8-5 work shift. The facility will be utilized for small general purpos equipment, vehicle and other gas/diesel engines, vehicle power drive trai components, etc., and is designed for rapid work flow adjustments to acco modate changes in equipment workloads. The planned use of the facility allocated 2% of its total capacity to support gas turbine engine work-loads. Current planned workload would utilize approximately 40% of the total capacity designated for the gas turbine engines. The compressors require no unique facility for depot level maintenance. TEAD is the onl DOD organic depot for compressors included in the study.

(b) SA-ALC. Kelly is the Air Force Technology Repair Cent (TRC) for the overhaul and test of large and small gas turbine engines and their related components/accessories. The small gas turbine engines are predominately Garrett products. Unique facilities include a foundry for the manufacturing of castings, a bearing reconditioning shop, and a state-of-the-art automated component inspection test area. Kelly is the assigned interservice depot for Garrett GTC85 gas turbine engines. The maintenance is performed in two areas, Bldg 329 for overhaul and Bldg 34 for testing. The total production space dedicated for the AGPUs and the "on-board" APUs is approximately 17,500 sq. ft. (Bldg 329-7,291 sq. ft., Bldg 340-10,325 sq. ft.). The support/back shop space, partially or com pletely utilized in support of the gas turbine engine workload, totals over 160,000 sq. ft. (i.e., painting, metalwork, plating, cleaning, etc. in addition to the dedicated space in Bldgs 329 and 340. The utilizati of the three work areas for the 4th quarter of FY 90 has averaged approximately 68% of the total available capacity. A new facility (Bld 331) to consolidate portions of the gas turbine engine workload (assemb and testing) is scheduled for a FY91 MCP. All other maintenance functi will remain in Bldg 329. Although Bldg 331 will house a portion of the gas turbine workload, space dedicated in the facility for this workloa less than 19% of the overall floor space. The primary workloads in the facility will be Air Turbine Starters, Jet Fuel Starters, and Accessory Drive Gearboxes which are components of "on-board" aircraft engine star ing systems. The new facility will incorporate features to not only ir prove maintenance productivity of the gas turbine engines/components bu also further reduce environmental problems associated with performing maintenance.

(c) NADEP Alameda. NADEP Alameda is the Naval Air Depot west coast repair site for large and small gas turbine engines specializing in Sunstrand/Turbomach products. NADEP Alameda is also Engineering Cognizant Field Activity for the T-11, T-27, T-62, GTCP95-[illegible]3 and GTCP100-54 auxiliary power unit worked at NADEP Cherry Point. NADEP Alameda also overhauls and tests Garrett/Air Research products and has dedicated facilities to accommodate a wide range of products such as APUs and components. This activity also repairs a large quantity of gas turbine engines and maintains repair and test processes to repair and test equipment for all types of pneumatic components. NADEP Alameda currently has five test cells with a sixth test cell planned to be on line in late FY 91 which will increase NADEP Alameda's capacity for the testing of the AGPU/APU. The available capacity dedicated for APUs/AGPUs is 203,700 M/HRS. The dedicated space is workloaded to 100% capacity.

(d) NADEP Cherry Point. NADEP Cherry Point is the Naval Aviation Technology Repair Center for the overhaul and test of large and small gas turbine engines specializing in Sunstrand/Turbomach products. This depot also overhauls Garrett products. The facilities accommodate processing numerous components and accessories. NADEP Cherry Point is assigned Navy depot/interservice repair point for the JFS 100-34, JFS 100-36, and the T-62T Series APUs. NADEP Cherry Point's repair and test facilities maintains all the necessary processes and repair and test equipment for all types of pneumatic components. This depot is the only Navy depot having an Engine Blade/Vane and Turbine Wheel Repair capabilities. This depot has four Automated Auxiliary Power Unit Test Cells. Bearings are refurbished in the bearing shop facility. Through the implementation of Total Quality Management (TQM) and productivity improvements, NADEP Cherry Point's total capacity will increase in [illegible]2 and FY 93. Approximately 15% of the total capacity available is de[illegible]te to the gas turbine engines included in the study. The planned workload for AGPUs/"on-board" APUs will utilize 90% of the total available capacity.

e. Equipment.

(1) Gas Turbine Engines. The study group's analysis of tools a test equipment, required to perform maintenance on gas turbine engines, determined that the tools and test equipment used on the large gas turbi engines/"on-board" APUs can be utilized on the engines included in the study with only minimal special equipment required due to manufacture or model differences. The gas turbine engine test cells can be adapted to all current configurations included in the study with only minor configuration changes. Requirements for special equipment were basically for engine stands or peculiar support shop equipment. The Air Force and Nav due to the magnitude of their large and small gas turbine workload, have the preponderance of the equipment for maintenance on gas turbine engin

(2) Compressors. The equipment required to support maintenanc of the common air compressor is common tools and test equipment used on other types of general purpose equipment.

f. Skills.

(1) **GAS TURBINE ENGINES:** The maintenance of gas turbine engines requires a range of mechanical/electrical skills found at most DOD organi depot facilities performing gas turbine engine maintenance. A large dive sity of skills and personnel are required for this very labor intensive commodity. The large number of engine components, various types of specialized materials, and the criticality of the high speed rotating parts are man-hour consumers when compared to the maintenance performed on othe conventional gas/diesel engines. The range of skills needed to support this workload is listed at table 11. The number of available personnel i job series were not calculated because the personnel are not dedicated t the ground support gas turbine engines. These personnel are utilized on all gas turbine engine workload.

Table 11

Gas Turbine Engine
Depot Labor Skills
(X = Skills Available)

Labor Skill	Job Series	SA-ALC	TEAD	NADEP Cherry Point	NADEP Alameda
Aircraft Engine Rpmn	8602	X	X	X	X
Equip Cleaner	7009	X	X	X	X
Sheet Metal Worker	3806	X	X	X	X
Sandblaster	5423	X	X	X	X
Machinist	3414	X	X	X	X
Elec Mamt Equip Mech	2602	X		X	X
Pneudraulic Sys Mech	8255	X	X	X	X
Welder	3707	X	X	X	X
Bearing Reconditioner	4850	X		X	
Electronic Engineer	0855	X	X	X	X
Electronic Tech	0856	X	X	X	X
Metallzing Equip Op	3707	X		X	X
Mechinical Engineer	0830	X	X	X	X
Chemist	1320	X	X	X	X
Physical Science Tech	1311	X	X	X	X
Heat Treater	3712	X	X	X	X
Power Sup Sys Mech	5378		X		
Industrial Eng Tech	0895	X	X	X	X

(2) **COMPRESSORS:** The maintenance of compressors requires the normal mechanical/electrical skills found at the depots performing mai nance on general purpose/combat/wheeled equipment. No specialized ski were identified by the study group.

g. Technical Support.

(1) Gas Turbine Engines. A staff of professional engineers (i.e., planners, quality specialists, metallurgists, etc.) are emplo at NADEP Alameda, NADEP Cherry Point, and SA-ALC providing technical support in the development of maintenance procedures/standards, tools/test equipment, and design/fabrication/modification of the engines/components. The technical support which can be provided by these activities is furthe enhanced with their in-house knowledge of gas turbine engines for specifi manufacturers and the large workload in other turbine engines. In addition, NADEP Alameda, NADEP Cherry Point, and SA-ALC have a staff of production engineers to provide assistance in-house and to the interservice community on maintenance shop planning and production enhancements. TEAD, due to its small gas turbine workload, has limited gas turbine engine engineering expertise. All of the activities do have technical writing, programing/automation, and CAD/CAM capabilities.

(2) Compressors. TEAD, as the prime DOD depot for compressors has a staff of professional engineers which provide technical assistance and engineering support for maintenance procedures, tools/test equipment design/fabrication/modification of the compressors.

h. Environmental Considerations. All of the performing activities have environmental management programs to comply with state and federal regulatory requirements. In addition, the new facilities under construc tion or planned will further improve the activities' ability to remain i compliance and reduce environmental clean-up cost. No significant impac was identified if the workload is relocated between the activities inclu ed in the study.

3. Efficiencies and Cost Reductions. The study team analyzed meth t improve efficiencies and reduce cost in the areas of interservicing, capacity utilization, and competition as follows:

a. Interservicing.

(1) An analysis of the data collected has shown that the milit services, as a whole, have intensively planned and managed the depot le maintenance of the ground power support gas turbine engines and air compressors for numerous years. The majority of the workload has been consolidated to maximize the benefits from existing facilities and a st of highly skilled/professional employees at the maintenance activities. End items and components have been interserviced to achieve cost savings/reductions, improved productivity, and a quality product at a reasonable cost.

(2) The study team evaluated one workload consolidation that would interservice current Army gas turbine engine depot maintenance to an Air Force depot. However, because the main purpose of this consolidation would be to improve capacity utilization, it is discussed in paragraph b., Capacity Utilization, below. The study team also noted that a current Air Force contract for depot level maintenance of the compressors should be evaluated prior to the contracts completion in FY 95 for possible organic interservicing through the Army. This is covered in the report recommendations.

b. Capacity Utilization.

(1) Gas Turbine Engines. The study team's analysis of the gas turbine engines has determined the following alternatives for capacity utilization.

(a) Retain the workload at current locations.

(b) Combine the various DDMC consolidation studies that include gas turbine engines. These studies are the rotary-wing aircraft, J79/T56 engines, TF30/F110/LM2500 engines, F-4/OV-10 aircraft. Also combine with these studies other gas turbine engines not being studied, such as the LACV-30, ship turbine components, "on-board" aircraft/ship APUs. Consolidating all gas turbine workload into a single study may provide the greatest opportunity for increased efficiencies and cost savings since the total capacity for all gas turbine engines would be analyzed to achieve the maximum utilization within the services. However the consolidation of gas turbine engines into a single study would requir a longer study time, due to the numerous types, applications, and activities performing maintenance for the engines.

(c) Transfer the gas turbine engine workload now at TEAD tc San Antonio Air Logistics Center (SA-ALC), consolidating it with their current gas turbine engine workload.

(2) It is the consensus of the study team that the best alternative to improve efficiencies and reduce cost within the scope of this study is the third alternative, transferring the gas turbine engine workload now at TEAD to SA-ALC. The gas turbine engines that would be transferred to SA-ALC under this alternative are the Army's gas turbine engines D424, GTCP85-127, and TT-10. The GTP36-50, currently being repaired by contract, would transition to SA-ALC when the DMWR was completed in FY 92.

(a) The consolidation will result in limited cost savings, possible improved efficiencies, and may be achieved within the shortest time frame. Table 12 identifies the methodology and assumptions utilize to develop the projected cost saving and expenses related in consolidati the workload. With the exception of the engine stands, dynamometer, anc limited special tooling, SA-ALC has sufficient equipment available to integrate the additional workload. The small number of personnel impact by the relocation could be integrated into other workloads at TEAD.

Table 12

Gas Turbine Engine Consolidation
Savings Computation

Methodology and Assumptions

- Cost Analysis - FY91 Dollars
  - Personnel (Per Space) $32K
  - No Separation/PCS Cost Involved
  - Includes Equipment Transfers, Facilities Modifications and Transition Management
  - Supply Support Ratio to Maintenance Support
    - Equal at all locations

(b) Table 13 provides the analysis of the estimated savin for consolidating the TEAD workload at SA-ALC. The savings are based c the reduction of 6 personnel spaces and the cost to transfer the limite associated equipment. It was the consensus of the study group that SA- would be able to integrate the workload without the need of additi l manpower due to the small manhours of workload being transferred.

Table 13

Estimated Savings to Move Gas Turbine Engine
Workload From TEAD to SA-ALC
($ IN MIL)

Savings	FY92	FY93	FY94	FY95	FY96	FY97
Spaces		6				
Salary	0.0	.192	.192	.192	.192	.192
Total	0.0	.192	.192	.192	.192	.192
Cost						
Equipment	0.0	.240	-	-	-	-
Total	0.0	.240	-	-	-	-
Net Savings	0.0	-.048	.192	.192	.192	.192

(3) Compressors. A comparison of the compressor workload versus total capacity was determined by the study group to be inapplicable due to the minute workload. TEAD, the performing activity, has no dedicated shop capacity for the compressor workload, due to the low volume of workload and M/HRS. The current air compressor workload at TEAD should not be relocated. The air compressor workload for the Air Force, which is on contract, could be relocated to TEAD depending on the total capacity available after all the consolidations studies have been approved and implemented. Since the contract does not expire until FY95, sufficient time is available to make a determination if it would be cost effective to bring the compressor workload back to the organic depot base.

c. Competition. It was the consensus of the study team that the competing of the gas turbine engine workload would not result in a cost savings. The core maintenance requirements, the various makes and models, and in some instances sole source rights would preclude cost effective competition. The Air Force compressor workload currently maintained within the organic depot base is core maintenance requirements in support of the Minuteman Missile system. The Army organic compressor workload is very small and consist of various models and sizes which would not provide opportunities for cost savings by competing.

4. Conclusions.

a. Gas turbine engines.

(1) If the gas turbine engine workload at TEAD were consolidated with the gas turbine engine workload at SA-ALC, six personnel spaces coul be saved. The study team has concluded that SA-ALC would be able to integrate the TEAD workload without additional manpower. After deducting the cost of the transferring of the equipment from the savings projected to result from the immolating six personnel spaces, the net savings for the period FY 91 through FY 95 would be $0.336M. For the period FY 96 through FY 97, an additional $0.384M in savings would accrue.

(2) The projected workload at NADEP Alameda, NADEP Cherry Point and TEAD seems to suggest that the gas turbine engine workload from all three depots could be consolidated at SA-ALC. However, gas turbine engines included within this study is closely linked to other gas turbin engines being maintained at NADEP Alameda and NADEP Cherry Point not included. Without a detailed study of the other gas turbine engines at these depots, any effort to consolidate could create turbulence and increased cost. Past studies of gas turbine engine workloads have in fa shown that relocation cost far out weight anticipated savings.

b. Compressors.

(1) Depot level repair of compressors for all services has bee consolidated at two locations: TEAD and an Air Force contractor. The total workload is small and has no significant impact on capacity utilization rates. The Air Force contract is a multi-year contract fro FY 90 through FY 95.

(2) Currently, compressors do not offer significant opportunities for further cost efficiencies or increased interservicing. However, prior to the completion of the Air Force contract in FY 95, the compressors should be revaluated for possible competition savings by competing the workload between the public and private sector.

5. Recommendations.

a. Gas Turbine Engines.

(1) The study team recommends that the ground support gas turbine engine workload at TEAD be consolidated at SA-ALC. This consolidation will fill existing shortfalls in workload at SA-ALC, and will combine similar types of work in one location. The consolidation should begin in FY 92, with the pilot overhaul program scheduled for FY 93. These milestones are critical to prevent a production delay on the Allison D424 engine , which supports the Army Patriot Air Defense Missile System.

(2) The study team recommends that a new study be performed on those gas turbine engines not being considered by any study team or all gas turbine engines be combined to provide the best opportunity for cost savings.

(3) The projected gas turbine engine capacity utilization of each of the four depots studied is estimated to be as follows if the consolidation which the study team recommends were implemented:

	FY92	FY93	FY94	FY95	FY96	FY97
SA-ALC	41	44	41	41	41	41
NADEP Cherry Point	15	15	15	15	15	15
NADEP Alameda	12	12	12	12	12	12
TEAD	46	0	0	0	0	0

The capacity utilization figures for FY 91 are not displayed because of the surge requirements. The above figures also reflect only the utilization of that capacity allocated to the ground support gas turbine engines covered in this study. All of the depots except TEAD have additional "on-board"/airborne gas turbine engine workload which, if included in this study, would show higher depot capacity utilization rates.

b. Compressors.

(1) The study team recommends that the current organic depot compressor workload remain at TEAD.

(2) The study team also recommends that the contract depot level repair of Air Force compressors be reviewed prior to the contract completing in FY 95. The review should determine if it would be cost effective to transfer the contract workload to TEAD.

(3) Capacity utilization rates for compressors were not included in this study. TEAD, the only organic depot source of repair for compressors, has no dedicated work area for the small workload. The small compressor workload has no impact on depot capacity utilization.

c. The study team projects the following total savings to result from all recommended actions for the period FY 91 through FY 95, and for the additional period FY 96 through FY 97:

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Consolidate TEAD gas turbine engines at SA-ALC	0.000	0.000	0.192	0.192	0.192	0.192	0.192
Yearly total savings	0.000	0.000	-0.048	0.192	0.192	0.192	0.192
Total FY 91 - FY 95				0.336			
Total FY 96 - FY 97						0.384	

The negative cost savings displayed in FY 93 reflects the transfer of the equipment and special tools from TEAD to SA-ALC.

d. Tables and graphs displaying the information discussed in this paragraph are in Appendix A.

APPENDIX A

The tables in this appendix portray the results of the actions recommended by this study team. The tables are as follows:

Table A-1. This table categories the efficiencies and cost reductions that the recommended actions would achieve.

Table A-2. This map shows the depot workload distribution for gas turbine engines that would result from the recommended actions.

Table A-3. This table portrays the total cost savings that would result from implementing the recommended actions from FY 91 through FY 97.

Table A-4. This table shows projected capacity utilization for FY 92.

Table A-5. This table shows projected capacity utilization for FY 93.

Table A-6. This table shows projected capacity utilization for FY 94.

Table A-7. This table shows projected capacity utilization for FY 95 through FY 97.

Table A-1

Gas Turbine Engine Depot Study
Gas Turbine Engine Efficiencies/Cost Reductions
Thru Streamlining/Realignment

Item/System	Depot	Consolidation	Down Sizing	Inter Service	Public/ Private
D424	SA-ALC	Yes	Yes-TEAD	Army	N/A
GTCP85-127	SA-ALC	Yes	Yes-TEAD	Army	N/A
TT-10	SA-ALC	Yes	Yes-TEAD	Army	N/A
GTCP36-50	SA-ALC	Yes	Garrett	Army	N/A

Table A-2

Proposed Gas Turbine Engine
Depot Maintenance Distribution

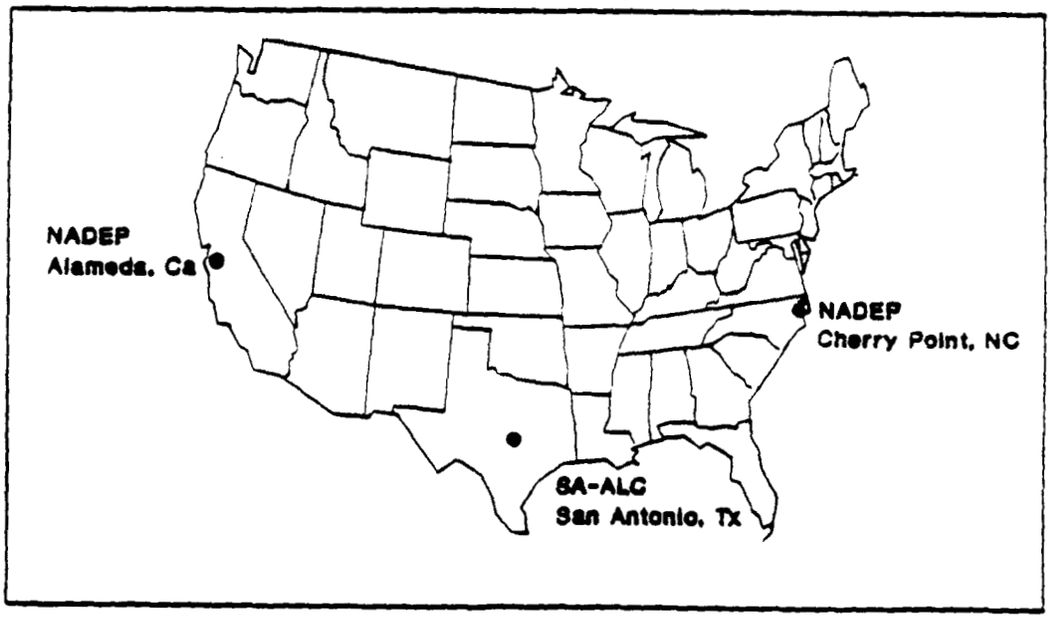


Table A-3

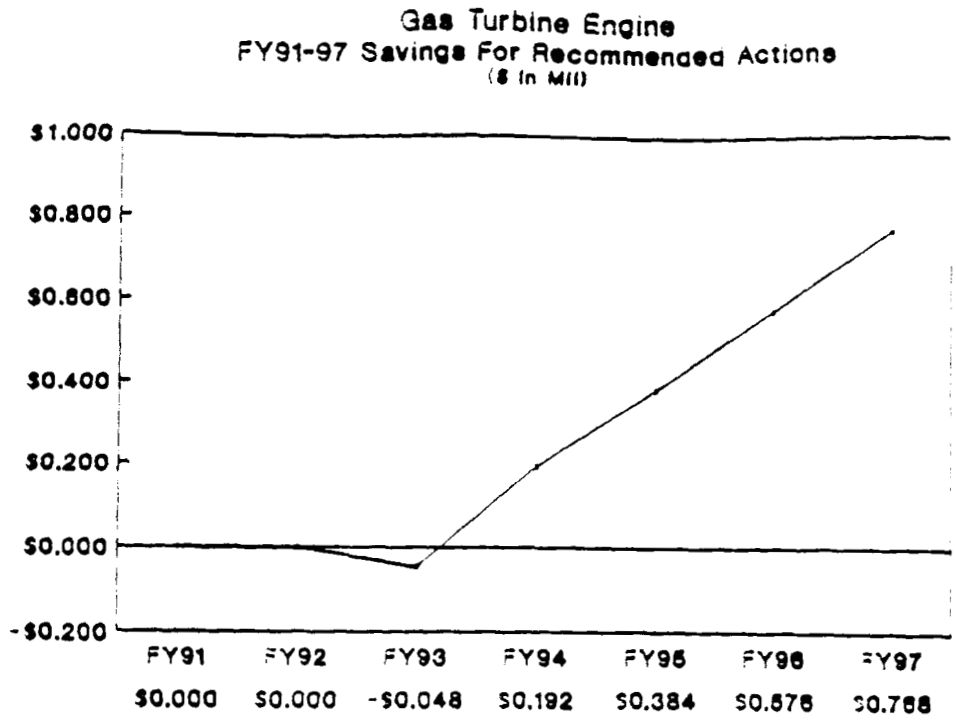


Table A-4

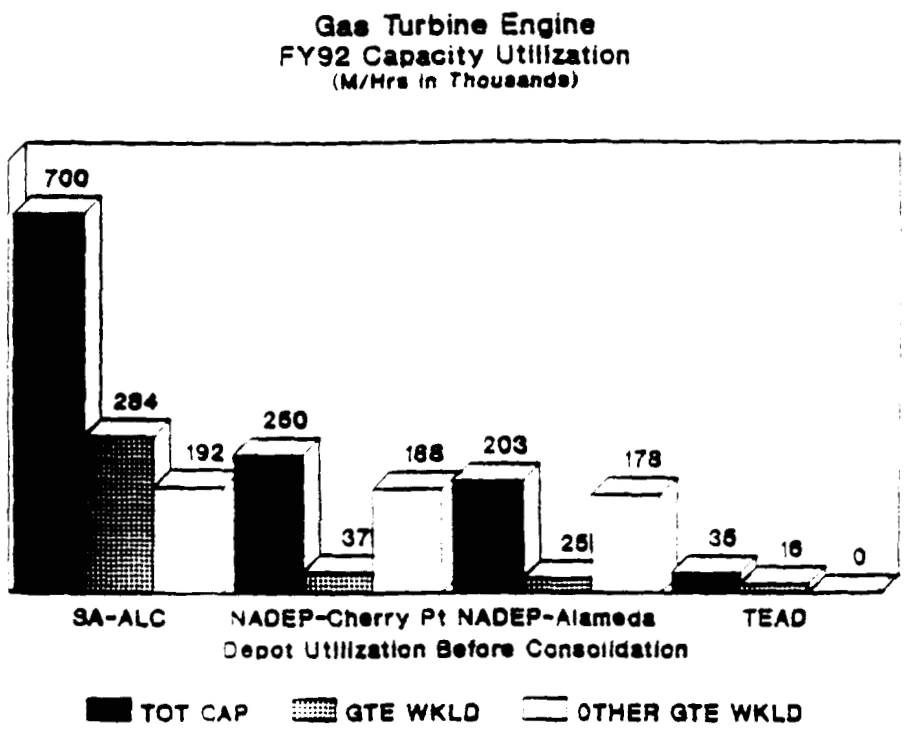


Table A-5

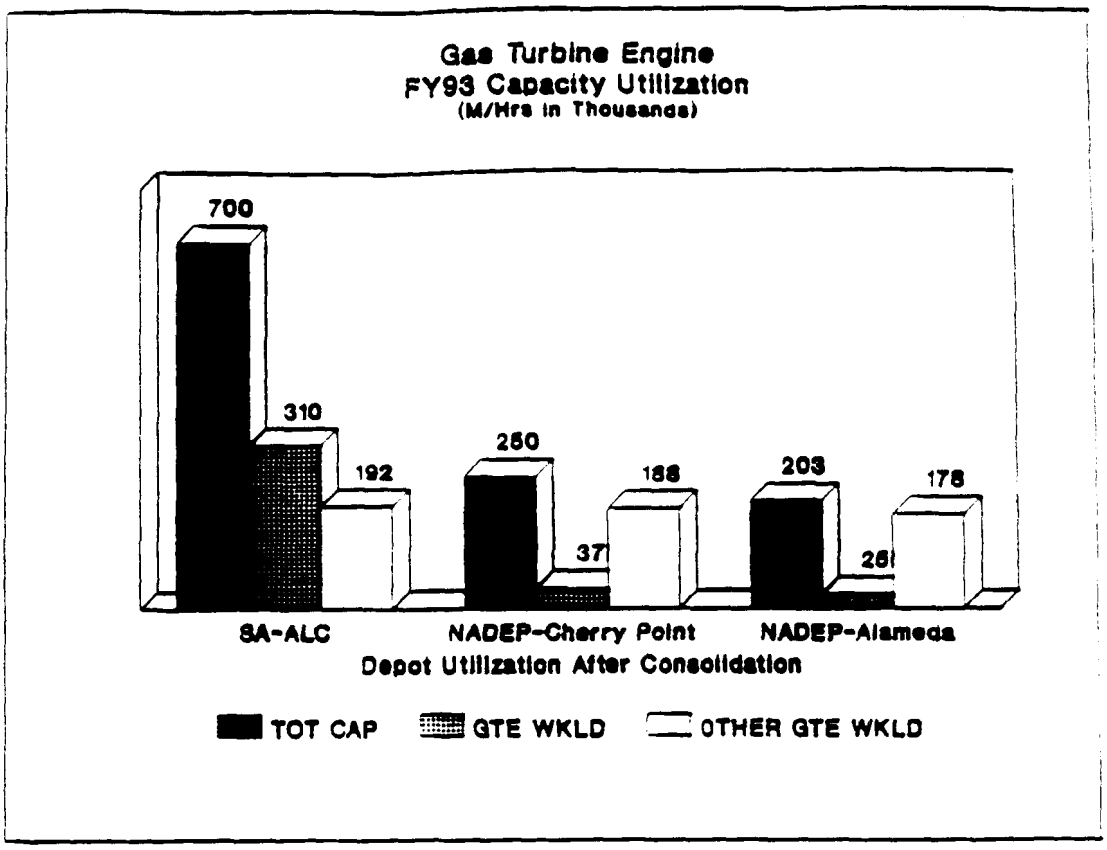


Table A-6

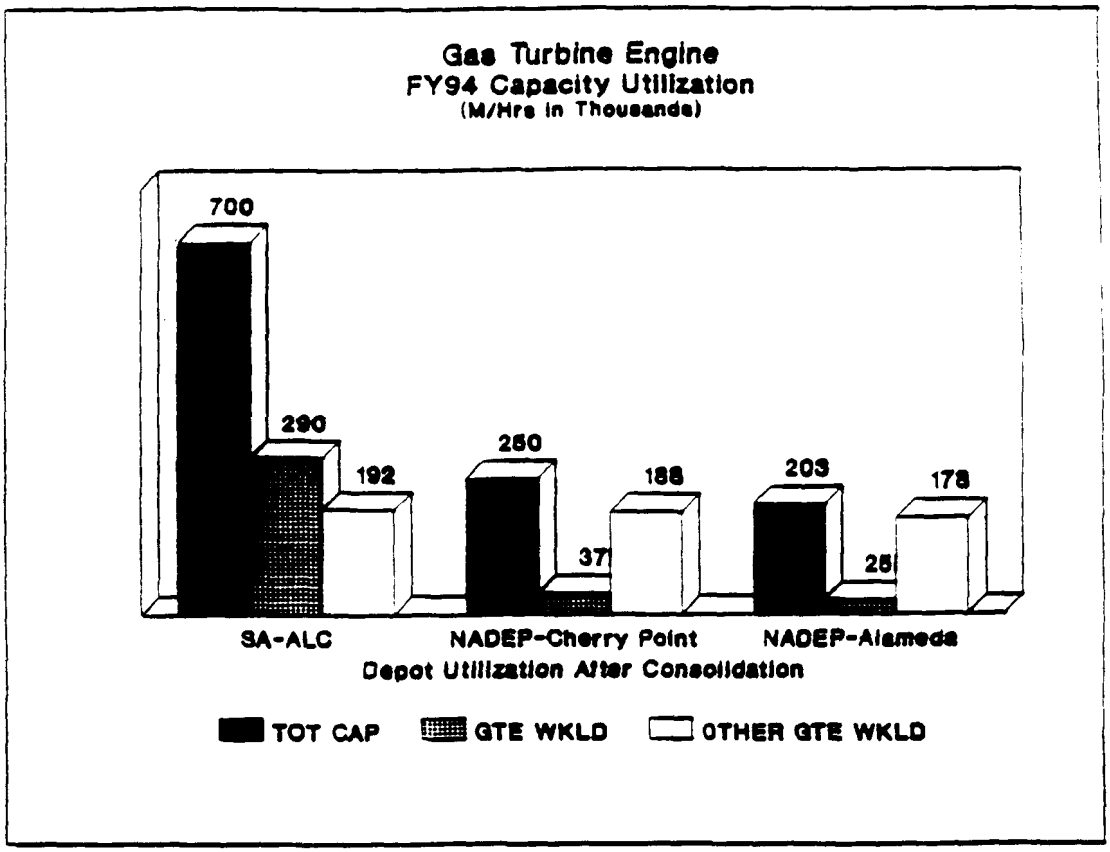
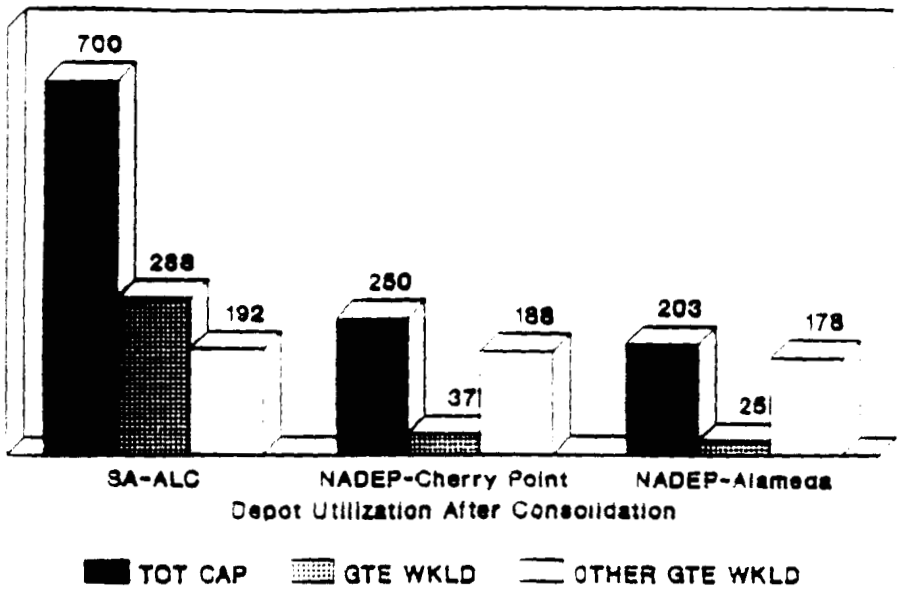


Table A-7


Gas Turbine Engine
FY95-97 Capacity Utilization
(M/Hrs in Thousands)
700
288
192
250
371
188
203
261
178
SA-ALC
NADEP-Cherry Point
NADEP-Alameda
Depot Utilization After Consolidation
TOT CAP
GTE WKLD
OTHER GTE WKLD

APPENDIX B

Table B-1. The Weapon System Matrix Source of Repair (SOR).

Table B-1

WEAPON SYSTEM MATRIX
SOR ACTION

PROGRAM CHARACTERISTICS				REPAIR PROGRAM			ACTION	SAVINGS DATA						
A	B	C	D	E	F	G	H	I						
ITEM	SERVICE USER LEAD (L)	NON-CORE (NC) CORE (C) ABOVE CORE (AC)	UNITS PER YEAR	SOR	ANNUAL WORKLOAD (DLH-K)	ANNUAL BUSINESS BASE ($M)	CONS, I/S OR P/PC DECISION (CONS-FY) (I/S-FY) (P/PC-FY)	PROJECTED SAVINGS ($M)						
								SERVICE	91	92	93	94	95	TOTAL
								COST OF ACTION: 0.240						
D424	A (L)	NC	19	TO	8.20	1.20								
GTCPS6-127	A (L)	C	3	TO	0.75	0.04								
TT-10	A (L)	C	15	TO	1.70	0.12		A	0.0	0.0	0.192	0.192	0.192	0.336
GTCPS6-60	A (L)	NC	15	TO	3.15	0.44								
PRIOR TOTAL			52		13.80	1.80								
NEW TOTAL			52	FK	13.80	1.80	CONS-93	NET SAVINGS	0.0	0.0	-.048	0.192	0.192	0.336

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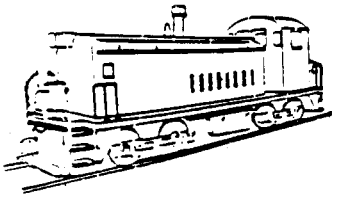
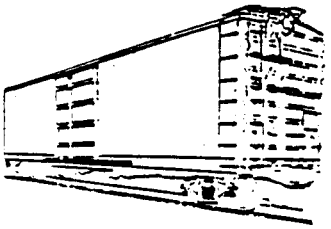
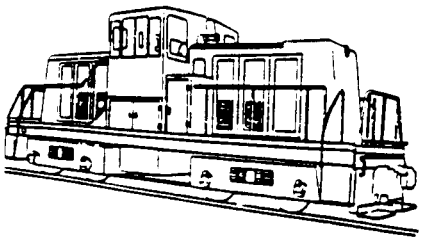
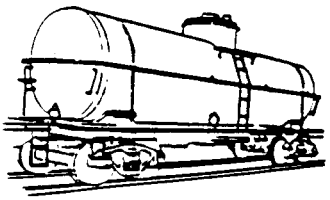
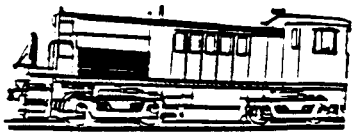
RAIL EQUIPMENT
DEPOT MAINTENANCE STUDY

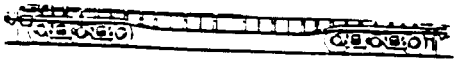












PREPARED FOR:

DEFENSE DEPOT MAINTENANCE COUNCIL

31 JANUARY 1991

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Rail Equipment Depot Maintenance Study

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EXECUTIVE SUMMARY

1. Reference:

a. Memorandum, Deputy Secretary of Defense, 30 June 1990, subject: Strengthening Depot Maintenance Activities.

b. Memorandum, Office of the Assistant Secretary of Defense for Production and Logistics, 8 August 1990, subject: Defense Depot Maintenance Council Meeting Minutes, 24 July 1990.

c. Headquarters, U.S. Army Materiel Command Maintenance Division tasking during VENUS televideo conference, 26 July 1990.

2. Due to the manner in which rail equipment is maintained, this study included both intermediate and depot level maintenance facilities. The U.S. Army Troop Support Command (TROSCOM) operates three Mobile Rail Repair Shops (MRRS) that provide intermediate maintenance to over 80 DOD customers that do not have such capabilities. The U.S. Army Tooele Army Depot is the only DOD facility that performs depot level repair of DOD railroad equipment. The study contains recommendations to reduce maintenance costs from 1991 thru 1997 from full utilization of depot capacity and merging of certain depot and intermediate functions.

3. The study concentrated its efforts on the captive fleet locomotives and rolling stock of the U.S. Army and the U.S. Air Force. The study excluded locomotive cranes, cabooses, and guard cars, as these items are or will be leaving the active inventory. The study also excluded the assets of the Defense Freight Railway Interchange Fleet (DFRIF) managed by the Military Traffic Management Command (MTMC), as this equipment receives running repairs under the practices of the Association of American Railroads (AAR) or the laws promulgated by the Federal Railroad Administration (FRA) and are not typically repaired at depot level. DFRIF cars operate on the privately owned trackage of the U.S. commercial railroads.

4. The cars operated by the U.S. Army in Korea and Japan were also excluded because repairs to these cars are mandated by the laws of those countries. Finally, rail assets from the U.S. Navy, U.S. Marine Corps, and the Defense Logistics Agency (DLA) are not included in this effort. Those services have no plans to modernize any locomotives during the time frame covered by this study. The U.S. Navy has plans for repair of small quantities of flatcars and boxcars programmed for the 1991-1997 period, primarily in the Eastern United States and contingent upon availability of funds.

5. The Defense Business Operations Funds (DBOF) cost methodology

was not utilized in this study.

6. The study was drafted by the U.S. Army from data and discussions that have been ongoing for the past several years within the DOD rail community. The services are currently requi under DOD 4140.50R, "Management and Standards of DOD Locomotives", dated June 1985, to take a number of steps to facilitate interservice support and coordination among DOD components in the management of DOD locomotive assets. The written report has been staffed with the U.S. Navy and the U.S. Air Force Railroad equipment managers for their formal concurrance.

a. Interservicing. The Tooele Rail Shop is the only source of organic level maintenance in the DOD. The U.S. Air Force already has its locomotive remanufacturing performed at the Tooele Army Depot and no further interservicing of current workload is possible. The study makes no further recommendations in this area.

b. Capacity utilization.

(1) The capacity of the Tooele Rail Shop is to remanufacture seven locomotives per year. Locomotive assets are programmed thru the study period years of 1991 thru 1997 to keep the depot at 100% capacity each year.

(2) TROSCOM currently operates three Mobile Rail Repair Shops (MRRS) that are satellited at New Cumberland Army Depot, Red River Army Depot, and the Tooele Army Depot. Consolidating the three TROSCOM Mobile Rail Repair Shops, which perform intermedia level maintenance at the Tooele Rail Shop under DESCOM, could sa ten personnel spaces.

c. Competition.

(1) The U.S. Army has formally offered to the Ballistic Missile Organization (BMO) of the U.S. Air Force to remanufacture any locomotives involved in the Peacekeeper (MX Missile) Rail Garrison Program (PRG) at the U.S. Army Tooele Army Depot Rail Shop. A total of 50 locomotives could be remanufactured for the PRG program over a number of years. Current USAF guidance only includes Full Scale Development program milestones. The target date for the USAF to make a decision to proceed from Full Scale Development to Deployment of the PRG train is officially To Be Determined (TBD).

(2) The U.S. Army has been selected by the USAF to provide both post fielding depot and intermediate level support to the PRG system if the PRG train system is deployed.

7. Summary. Consolidation and relocation of the Mobile Rail Repair Shops to the Tooele Rail Shop will save $ 1,080,000 thru Fy 97.

DEFENSE DEPOT MAINTENANCE COUNCIL
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RAIL EQUIPMENT

DEPOT MAINTENANCE STUDY

1. STUDY METHODOLOGY.

a. SCOPE:

(1) This study analyzed DoD depot maintenance capacity and workload for the rail equipment identified in paragraph (2) below. It examines ways to reduce the cost of depot maintenance on rail equipment over fiscal years (FY) 1991 through 1995, through increased interservice workload consolidation, increased utilization of depot capacity, and increased competition. It recommends actions to reduce depot maintenance costs, and it quantifies the total predicted savings that would result from these actions for FY 1991 through FY 1995. It also predicts the long range effects of its recommendations thorugh FY 1996 and FY 1997, but identifies these separately from the FY 1991 through FY 1995 savings.

(2) The study group concentrated its efforts on locomotives and rolling stock for the U.S. Army and U.S. Air Force, The study group excluded locomotive cranes, cabooses, and guard cars, as these items are either not normally maintained at depot level, or has or will leave the active inventory. The study group also excluded MTMC interchange fleet rolling stock, as this equipment receives running repairs under the practices of the Association of American Railroads (AAR) and are not typically repaired at depot level. The cars operated by the U.S. Army in Korea and Japan were also excluded, as repairs to these cars are mandated by the laws of those countries. Finally, rail assets from the U.S. Navy, U.S. Marine Corps, and the Defense Logistics Agency (DLA) are not included in this effort. The U.S. Navy has repairs for small quantities of flatcars and boxcars programmed for the 1991-1997 period, primarily in the Eastern United States and contingent upon availability of funds. The U.S. Navy, U.S. Marine Corps, and DLA have no locomotives programmed for depot level repair during the study period.

b. STUDY ASSUMPTIONS:

(1) INVENTORY

(a) The locomotives and rolling stock of the military services that operate on military owned trackage are obsolete, increasingly unsupportable, and need replacement and/or

modernization.

(b) Unless modernized, it is questionable if the current military rail equipment could fully support troop outloadings, ammunition plant production schedules, depot/weapon station operations, or terminal outport facilities in periods of mobilization or national emergencies

(c) The US Army will continue to replace locomotive cranes with rough terrain/rubber tired cranes such that locomotive cranes will be out of the inventory within several years.

(d) The US Army will continue to own the majority of the DOD captive railroad equipment fleet.

(e) Previously announced base closures will have no effect upon required inventory levels for either locomotives or rolling stock.

(2) COMMERCIAL INDUSTRY IMPACTS

(a) The commercial rail industry does not historically have the capacity to fully support the military rail requirements during peacetime or mobilization.

(b) Major non-railroad corporations will continue to operate internal railroad systems, similar to those operated by the military services. These companies will be competitors for commercial maintenance capabilities.

(c) The US DOT will not exercise its legal authority to redistribute transportation resources of either the Class I, Regional, or Short Line railroads, for use on military facilities during national emergencies.

(d) Commercial rail repair firms will continue to prefer to work for civilian firms and bid on government contracts only if work for commercial firms is unavailable/insufficient.

(e) There are not sufficient used/high quality assets available in the commercial market to meet the rolling stock needs of the services, necessitating the remanufacture of possibly a major portion of its current rolling stock assets to meet peacetime and mobilization requirements.

(f) The major railroads will continue their programs to eliminate their own depot level maintenance facilities in favor of outsourcing the work to private companies in order to eliminate fixed costs.

(g) The major railroads will continue to eliminate their rail equipment fleets in favor of using rolling stock assets obtained from leasing firms and renting locomotives under the "Power by the Hour" concept.

(h) There are insufficient assets currently available

on the commercial market to meet all of the equipment needs of the military and commercial railroads during peacetime and mobilization.

(i) Any future commercial remanufacturing programs will continue to show the same level of negative pre-award surveys that have been experienced by TROSCOM over the FY 85 to FY 88 period.

(j) Because of physical track limitations, the size of commercial locomotives, military building restrictions commercial railroad work rules, and commercial railroad profit standards for locomotive usage, commercial locomotives cannot be expected to perform internal switching functions inside military facilities. Commercial locomotives normally will not procede beyond the classification yard just inside the gate of a military facility.

(3) PEACEKEEPER RAIL GARRISON (PRG).

(a) The Peackeeper Rail Garrison full scale production program will be incrementally funded starting no sooner than FY 94.

(b) The US Air Force will reaffirm its informal decision to have the US Army remanufacture the PRG locomotives at the Tooele Rail Shop rather than thru a contract with Boeing.

(c) The Army Materiel Command (AMC) will continue its written support of the bid to obtain the Peacekeeker (MX Missle) locomotive remanufacture program for the Tooele Rail Shop under overall TROSCOM program management.

(4) ACQUISITION & FUNDING

(a) The prices for used locomotives will continue to rise steeply over the next few years suggesting that the U.S. Army would be wise to procure and/or remanufacture needed replacements for the remaining 50 each 100 ton & 120 ton locomotives as soon as possible.

(b) TROSCOM will continue to pursue and receive funding to acquire used locomotives and rolling stock thru the study period.

(c) O&MA funds will be made available to accomplish remanufacturing of the remaining 60 ton and 80 ton Army locomotives.

(d) A satisfactory level of funding will be available to finance repair of military locomotives and rolling stock.

(e) The U.S. Army will continue to centrally fund and manage the remanufacture, modernization, and acquisition of needed rail equipment.

(f) The DA DCSLOG will continue to maintain support for the rail program funding levels in the current Long Range Army Materiel Requirements Plan (LRAMRP) process.

(5) TOOELE ARMY DEPOT

(a) The minimum size of a DOD depot level rail shop is 35 direct labor employees to maintain needed skill levels.

(b) The Tooele Rail Shop will continue to be recognized as an Association of American Railroad (AAR) certified shop in all but selected air brake work.

(c) The Tooele Rail Shop will receive AAR certification in all aspects of brake repair in the next few years.

(6) POLICY/REGULATIONS/PRACTICES

(a) Installation will continue to have the right to have its intermediate maintenance performed by other than an Army MRRS if it can accomplish such repairs at a lower cost.

(b) TROSCOM will continue to act as the railroad system proponent as well as the developer and fielding agent for this materiel.

(c) The Mobile Rail Repair Shop (MRRS) mission now managed by TROSCOM will transfer to DESCOM in FY 91. The funtions, personnel, and equipment will transfer to the Tooele Rail Shop.

(d) The US Army VANGUARD project will maintain its current recommendation to maintain the need for rail maintenance practices and requirements.

(7) OTHER SERVICES

(a) The U.S. Air Force (non PRG) will continue to centrally manage its rail equipment modernization program.

(b) The U.S. Navy will continue to centrally manage its rail equipment modernization program using funds provide by the individual installations operating the equipment.

(c) The equipment owned by DLA and the USMC are of such low quantities as to not be a decision factor in determining depot level requirements.

c. STUDY GROUP MEMBERS. The organizations listed as Study Group Members did not meet as a group in one location to assemble this package. This was unfeasible given previous mission and travel requirements of the study group members. Because of the normal level of data sharing between the DOD rail community, it was posssible to assemble the data for the study by means of written and/or telephonic communication.

STUDY GROUP MEMBERS

NAME	ASSIGNMENT	ORG	PHONE (DSN)
MR. MICHAEL RUFFUS	CHAIRMAN	TROSCOM	693-2111
MR. MICHAEL SACCA	MEMBER	TROSCOM	693-9377
MR. BOB ARRINGTON	MEMBER	TEAD	458-5913
MR. WALT HILSABECK	MEMBER	NAVFAC	288-7070
MR. GASTON FOSKEY	MEMBER	WRAFB	468-2717

d. SITE VISITS. All of the organizations on Chart One have had personnel who have visited either the Tooele Army Depot Rail Shop and/or a wide variety of commercial remanufacturing facilities. Because of the short suspense dates involved in this project, no special site visits were made in connection with the preparation of this paper. The lone exception was a visit by Mr. Walt Hilsabeck (U.S. Navy) to TROSCOM on 10 September 1990 to personally deliver U.S. Navy input for inclusion in this paper. Both the U.S. Navy and the U.S. Air Force are in regular contact with TROSCOM on rail related matters.

e. DATA COLLECTION. The team obtained and studied data from numerous sources. For example, each of the services keep records regarding railroad equipment requirements and assets. These records are regularly shared within the DOD rail community. The services have been involved in both commercial and organic remanufacturing of locomotives throughout the 1980's. Exact contract costs and data specifications for the remanufacturing of locomotives and reconditioning of both boxcars and flatcars were also available to the members of the study organizations.

2. ANALYSIS

a. INTRODUCTION. The study arrays and analyzes the data collected to develop a profile of the current situation; to identify the potential for savings from increased competition, increased capacity utilization, and increased interservicing; and to determine the extent of these potential savings. To do this the study categorized rail equipment, and systematically compared each affected maintenance location with respect to maintenance and support facilities; equipment; skills; technical support; environmental considerations; organic, contract, and interservice workload; and changes in capacity utilization and interservicing expected to result from recommended actions.

b. CATEGORIES OF RAIL EQUIPMENT.

(1) Table 1 lists the major categories of railroad equipment owned either by the U.S Army or the U.S. Air Force. The U.S. Army has used both organic and commercial depot type facilities to remanufacture locomotives. Neither service has yet reconditioned its fleet of rolling stock assets listed on the chart.

(2) Under an Inter-Agency Agreement with the U.S. DOT, TROSCOM is in the process of acquiring used/reconditioned rail equipment on the commercial market. As of this date, 18 each 20,000 gallon Petroleum, Oil, and Lubricants (POL) tank cars and 18 each 120 ton industry standard locomotives have been procured through the DOT. Bids on the acquisition of used boxcars and used flatcars were opened in late August 1989. Only one of the box car bidders was deemed responsive and none of the flat car bids were acceptable. Solicitations for small quantities of either used or new chemical tank

TABLE 1
RAIL EQUIPMENT

TYPE	MISSION	SERVICE	DEPOT FACILITY	PRIME CONTRACTOR
LOCOMOTIVE, 60 TON	SWITCHING	ARMY AIR FORCE	TEAD	N.A.
LOCOMOTIVE, 80 TON	SWITCHING	ARMY AIR FORCE	TEAD	N.A
LOCOMOTIVE,100 TON	SWITCHING	ARMY	TEAD	N.A.
LOCOMOTIVE,120 TON	SWITCHING	ARMY AIR FORCE	TEAD	N.A.
BOXCAR, 50-70 TON	AMMUNITION & MATERIEL TRANSPORT	ARMY	TEAD	N.A.
FLATCAR 50-100 TON	AMMUNITION & MATERIEL TRANSPORT	ARMY	TEAD	N.A
TANK CAR, POL	PETROLEUM, OIL, LUBRICANTS	ARMY	TEAD	N.A.
TANK CAR, CHEMICAL	AMMUNITION & MATERIEL TRANSPORT	ARMY	TEAD	N.A.

cars did not result in a single bid from tank car builders, railroads, or rail equipment holding companies. It does not appear probable that obsolete railcars can be solely replaced by acquisition of used or new equipment. The response from private industry to date would indicate that the Army needs to develop a formal Business Plan to modernize its locomotive and rolling stock fleet through a long range overhaul program.

(3) There is only one DMISA in force between the military services. That DMISA is between TROSCOM and the U.S Air Force Warner-Robbins Air Logistics Center. The DMISA is for TROSCOM to accomplish depot level repairs to U.S. Air Force locomotives. Repairs are scheduled on a yearly basis based on funds provided by the U.S. Air Force. Table 2 depicts this DMISA. Table 3 shows the non-DMISA rail equipment workload.

c. WORKLOAD ANALYSIS.

(1) The first step in analyzing rail equipment depot level maintenance was to evaluate all currently planned workload. The workload for FY 1991 through FY 1997 is displayed by service in Tables 4, 5, and 6. Each table splits the service's total workload into organic work, contract work, and interservice work. Each shows the total cost and total direct labor manhour requirement for the service's workload.

(2) The single DoD depot which performs rail equipment repair, and the three mobile rail repair shops (MRRS) which perform intermediate level repair, are shown on the map in Table 7.

(3) Projected capacity utilization for the TEAD Rail Shop, based upon the workload projected in Tables 4, 5, and 6 is as follows:

	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
TEAD Rail Shop Capacity Utilization	100%	100%	100%	100%	100%	100%	100%

d. MAINTENANCE AND SUPPORT FACILITIES

(1) Table A-4 in Appendix A is a floor diagram of the Tooele Army Depot Rail Shop showing the major work stations occupied by a 120 ton locomotive undergoing remanufacturing. The number of personnel needed for this full capacity operation is 35 people.

(2) The Tooele Rail Shop is modernizing portions of its physical plant and equipment to lower its labor costs needed to remanufacture a locomotive.

(3) The Tooele Army Depot Rail Shop is physically located 63 miles Notheast of the depot on the property of Hill AFB, Ogden Ut. A review conducted by the depot in 1989 indicated that it would cost over $ 54.5 million to move and or reestablish the existing Rail Shop

TABLE 2
RAIL EQUIPMENT MAINTENANCE DMISA WORKLOAD

EQUIPMENT	AGENT (MAINTENANCE MANAGER)	PRINCIPAL USER	SOURCE OF REPAIR
LOCOMOTIVE, 60 TON	TROSCOM	USAF	TEAD
LOCOMOTIVE, 80 TON	TROSCOM	USAF	TEAD

TABLE 3
RAIL EQUIPMENT MAINTENANCE NON-DMISA WORKLOAD

WORKLOAD	LOCATION OF DEPOT MAINTENANCE
LOCOMOTIVE, 60 TON	TEAD
LOCOMOTIVE, 80 TON	TEAD
LOCOMOTIVE, 100 TON	TEAD
LOCOMOTIVE, 120 TON	TEAD
FLAT CAR	TEAD
BOX CAR	TEAD
TANK CAR, POL	TEAD
TANK CAR, CHEMICAL	TEAD
HOPPER CAR	TEAD
GONDOLA CAR	TEAD

TABLE 4
NAVY RAIL EQUIPMENT WORKLOAD DISTRIBUTION

	FY 91		FY 92		FY 93		FY 94		FY 95		FY 96		FY 97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
ORGANIC														
CONTRACT														
INTER-SERVICE	NO DEPOT LEVEL WORKLOAD PROJECTED													
TOTAL $														
TOTAL WORK HOURS														

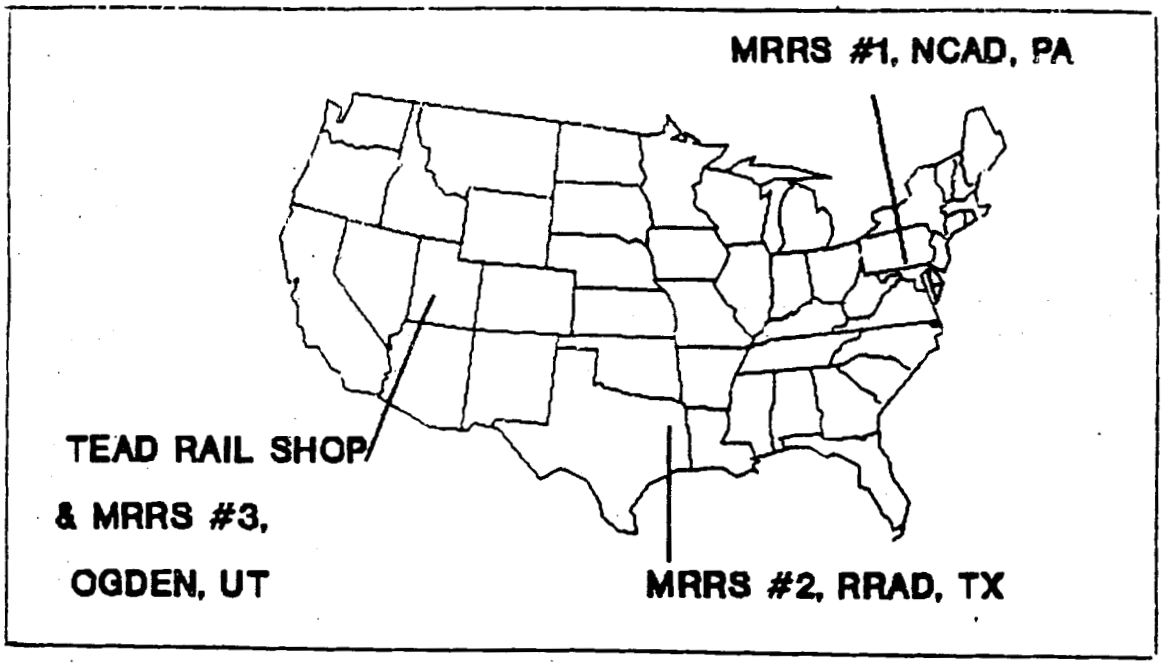
TABLE 5
AIR FORCE RAIL EQUIPMENT WORKLOAD DISTRIBUTION

	FY 91		FY 92		FY 93		FY 94		FY 95		FY 96		FY 97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
ORGANIC														
CONTRACT														
INTER-SERVICE	60	3.0	65	4.3	59	3.9	65	4.3	59	3.9	59	3.9	53	3.1
TOTAL $	26.4													
TOTAL WORK HOURS	432,982													

TABLE 6
ARMY RAIL EQUIPMENT WORKLOAD DISTRIBUTION

	FY 91		FY 92		FY 93		FY 94		FY 95		FY 96		FY 97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
ORGANIC	40	2.0	35	2.8	41	3.9	35	3.4	41	3.5	41	3.5	47	3.5
CONTRACT														
INTER-SERVICE														
TOTAL $	22.6													
TOTAL WORK HOURS	285,452													

TABLE 7
RAIL EQUIPMENT MAINTENANCE WORKLOAD DISTRIBUTION



at Tooele depot proper. This study did not reevalute the relocation of the Rail Shop.

(4) Because the Rail Shop is on Hill AFB, the U.S. Air Force would charge the Army for any environmental work needed to return the Rail Shop property back to a suitable conditioned for use by the U.S. Air Force. The preliminary estimates from Hill AFB is that it would take over $ 360 million to remove the environmental contaminents from the Rail Shop site to meet recently enacted state and federal EPA standards. The Rail Shop is also listed on the Historical Register of the state of Utah.

e. EQUIPMENT. The Tooele Rail Shop has in place lathes, wheel presses, overhead cranes, drop pit, paint shed, test/measurement/diagnostic equipment (TMDE) peculiar to the rail industry which would be very difficult and expensive to move and/or replace.

f. SKILLS. Table 8 shows the breakout of the skills of the workers used to remanufacture locomotives at the Tooele Rail Shop.

g. TECHNICAL SUPPORT. Locomotive remanufacturing is documented by Army developed specifications and/or similar documents published by major locomotive manufacturers. Repair times and tasks for rolling stock are adequately documented by publications from the AAR and similar railroad industry associations. The Production Engineering Division at Tooele also develops technical publications using state of the art CAD/CAM technology. Additional support is available from depot field support functional areas. A pilot model shop is also available to support the Rail Shop.

h. ENVIRONMENTAL CONSIDERATIONS. The remanufacture of locomotives involves a number of procedures to properly handle hazardous compounds. Among these are the fluids used in dip tanks to clean various locomotive parts. Facilities to contain and trap the sand, steel shot, or other abrasive materiels used to clean the major metal portions of the locomotive must be present. Finally, a paint booth that meets the Volatile Organic Compounds (VOC) recovery and containment regulations must be present. The Tooele Rail Shop meets all applicable state and federal requirements.

3. EFFICIENCIES AND COST REDUCTIONS.

a. The study looked for ways to improve efficiency and reduce costs in the three areas of interservicing, capacity utilization, and competition. This paragraph discussed the team's finding in each area.

b. Interservicing. All organic depot level repair of rail equipment covered by this study is done at TEAD Rail Shop. No further interservicing is possible.

c. Capacity utilization.

(1) Although there is only one DoD depot, there are three

TABLE 8
RAIL EQUIPMENT REPAIR SKILLS AT TEAD

SKILL	NUMBER OF PERSONNEL
ELECTRICIAN	8
HEAVY EQUIPMENT MECHANIC	4
EQUIPMENT MECHANIC	2
MACHINIST	3
ENGINEER/MECHANIC	1
PROGRAM EXPEDITER	1
FORKLIFT OPERATOR	1
DROP PIT MECHANIC	4
AWS WELDER	4
PIPEFITTER	1
CABINET MAKER	1
SHEET METAL MECHANIC	1
PAINTER	3
PAINT/BLASTER	1
EQUIPMENT CLEANER	1

TROSCOM mobile rail repair shops (MRRS) performing intermediate level maintenance on rail equipment covered by this study. These three shops are located at New Cumberland Army Depot (NCAD), PA; Red River Army Depot (RRAD), TX; and TEAD, UT. The study examined consolidating these three shops under DESCOM at the TEAD Rail Shop.

(2) Using the methodology shown in table 9, the study concluded that the MRRS mission could be reduced from 27 spaces to 17 if this consolidation were implemented. The study team's estimate of possible net savings through FY 1995, $678,000, is shown in table 10. For the period FY 1996 through FY 1997, the study team estimates that an additional $402,000 could accrue. Actual savings may be less than that indicated on that table due to the fact that recent retirements have left a number of positions vacant at the MRRS locations. Final savings will be based on the number of personnel on board at the time of MRRS consolidation.

(3) In addition, Tooele will take over the annual inspection function now performed by TROSCOM personnel in anticipation of the annual repair visit of MRRS personnel to an installation. TROSCOM will retain a periodic inspection function to assure the safety of the railroad system. Installations would be targeted for inspection based on repair data and to assure uniformity in application of inspection regulations. This would bring the DoD railroad system into parallel with the Federal Railroad Administration (FRA) role with the Class I and Regional Railroads. It would also put the DoD railroad system in line with recent recommendations made by the General Accounting Office (GAO) on ways to improve the FRA inspection system. Military installation already have the right, under existing regulations, to have their intermediate rail maintenance performed by facility or contractor personnel, in lieu of using the services of the TROSCOM MRRS.

(4) Additional savings might be possible by changing the current requirements regarding the performance of annual inspection and maintenance tasks. Current regulations, AR 56-3 and DOD 4140.50R, require TROSCOM to inspect the equipment at each installation on an annual basis. Each installation should be allowed to have locally qualified (government, contractor, or commercial railroad) personnel perform the annual inspection if it would be more cost effective than using TROSCOM or Tooele inspectors. Changing to on condition maintenace rules on parts replacement might also bring additional savings. Such rule changes will be taken up by the DOD Interservice Locomotive Management Committee at its annual meeting in February 1991.

c. Competition. The study team examined possible savings resulting from Army remanufacture of locomotives for the Peacekeeper Rail Garrison (PRG) program. Full scale production and deployment of the PRG has not yet been approved. Production rates and fielding schedules that would be required if the PRG were approved are not known. The cost of remanufacturing the PRG locomotives at the Tooele Rail Shop is $ 1,500,000 each. While exact estimates on the cost per locomotive of Boeing managing the remanufacture program are proprietary and unknown at this time, it is commonly assumed to be at least $ 3,000,000 each.

TABLE 9
MRRS SAVINGS COMPUTATION

ECONOMIC ANALYSIS

PERSONNEL

AVERAGE SALARY	$28K
BENEFITS	15% OF SALARY
PCS COSTS	$30K

30% WORKFORCE WILL PCS
35% WORKFORCE TRANSFER TO OTHER POSITIONS
35% WORK FORCE WILL BE SEPARATED

MERGER EFFICIENCY

REDUCE TENANT ACTIVITY COSTS AT THREE SITES
$20.2K IN OVERHEAD COSTS REDUCED

TABLE 10
SAVINGS FROM CONSOLIDATION OF MRRS

SAVINGS	FY91	FY92	FY93	FY94	FY95	TOTAL
SPACES	10	-	-	-	-	10
SALARY	.281	.281	.281	.281	.281	$1.405M
COSTS						
MOVE PEOPLE	.180	-	-	-	-	$.180M
SEVER PEOPLE	.147	-	-	-	-	$.147M
TOTAL COST	.327	-	-	-	-	$.327M
INCREASE TDY	.080	.080	.080	.080	.080	$.400M
SAVINGS	-.126	.201	.201	.201	.201	$.678M

(2) Based upon these assumptions, the study estimates that the cost of remanufacturing the locomotives required to support PRG could be reduced by a significant amount below previous U.S. Air Force estimates if the Army, rather than a private contractor, does the remanufacture. The Army would do the remanufacture at the TEAD Rail Shop.

4. CONCLUSIONS.

a. The continual decline of commercially available depot level repair capability makes it essential for the DOD to maintain core depot capability for railroad equipment.

b. Consolidating the three TROSCOM mobile rail repair shops, which perform intermediate-level maintenance, at TEAD Rail Shop under DESCOM, could save ten personnel spaces. One of the these shops is currently at TEAD Rail Shop. The other two are located at NCAD and RRAD.

c. If the Army, rather than a private contractor, remanufactures the locomotives estimated to be needed for the PRG, it would be possible for the DOD to save up to $ 1,000,000 per locomotive for each asset remanufactured for the PRG program.

5. RECOMMENDATIONS.

a. The study recommends that the following actions be taken:

(1) Consolidate the mobile rail repair shops at NCAD, RRAD and TEAD at the Ogden location for a savings of over $ 1,000,000.

(2) The Army remanufacture locomotives required for the Peacekeeper Rail Garrison (PRG) if it is approved for full scale production and deployment.

b. If the actions recommended in the study were implemented, the projected rail capacity utilization at TEAD Rail Shop would be as follows:

FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
100%	100%	100%	100%	100%	100%	100%

c. Graphs and charts displaying the information discussed in this paragraph are in Appendix A.

APPENDIX A

The tables in this appendix portray the results of the actions recommended by the study team. The tables are as follows:

Table A-1.	This table categorizes the efficiencies and cost reductions that the recommended actions would achieve.
Table A-2.	This map shows the depot workload distribution that would result from the recommended actions.
Table A-3.	This table shows the capacity utilization of TEAD rail shop that would result from implementing the study team's recommendations.
Table A-4.	This table shows the floor layout of the TEAD Rail Shop.

TABLE A-1
RAIL EQUIPMENT EFFICIENCIES/COST REDUCTIONS

ITEM/SYSTEM	DEPOT	CONSOLIDATION	DOWN SIZING	INTER SERVICE	PUBLIC/ PRIVATE
ALL	TEAD RAIL SHOP	YES	YES	ARMY, AIR. FORCE	YES
ALL	NCAD MRRS	YES	YES	N/A	N/A
ALL	RRAD MRRS	YES	YES	N/A	N/A

TABLE A-2
RAIL EQUIPMENT MAINTENANCE WORKLOAD DISTRIBUTION PROPOSED

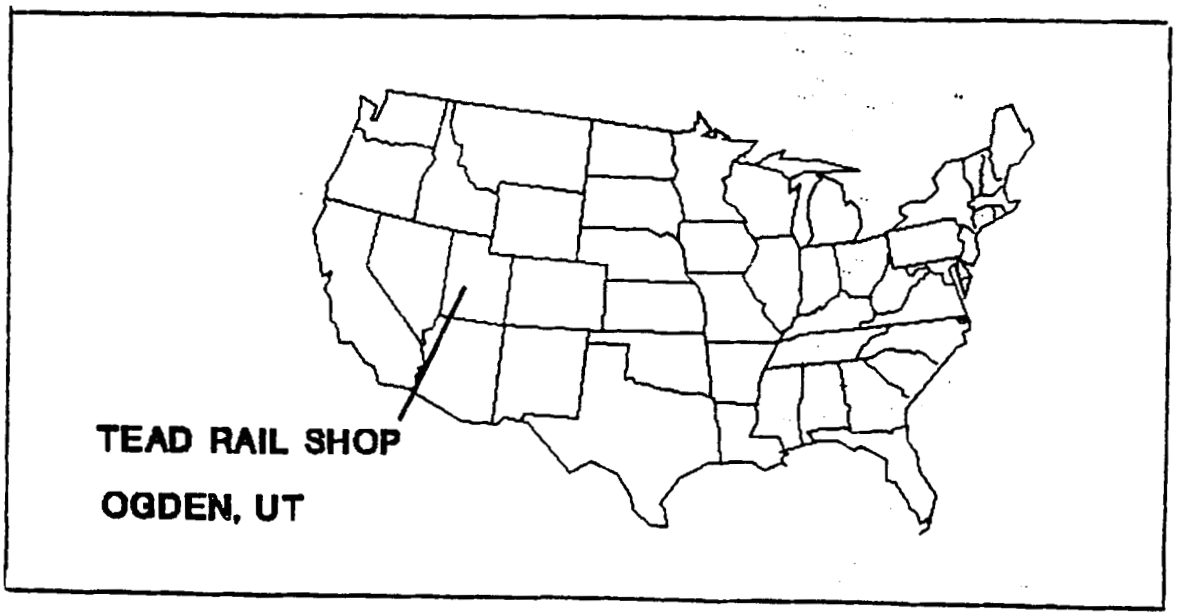


TABLE A-3
RAIL CAPACITY UTILIZATION (IMPLEMENTED)

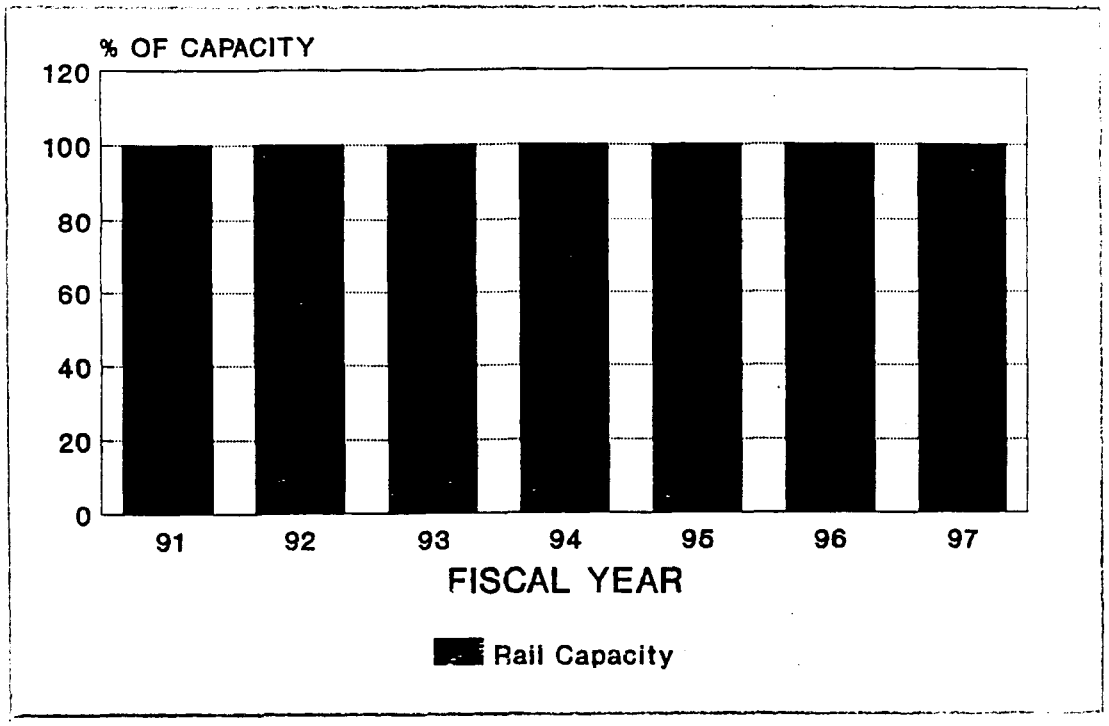
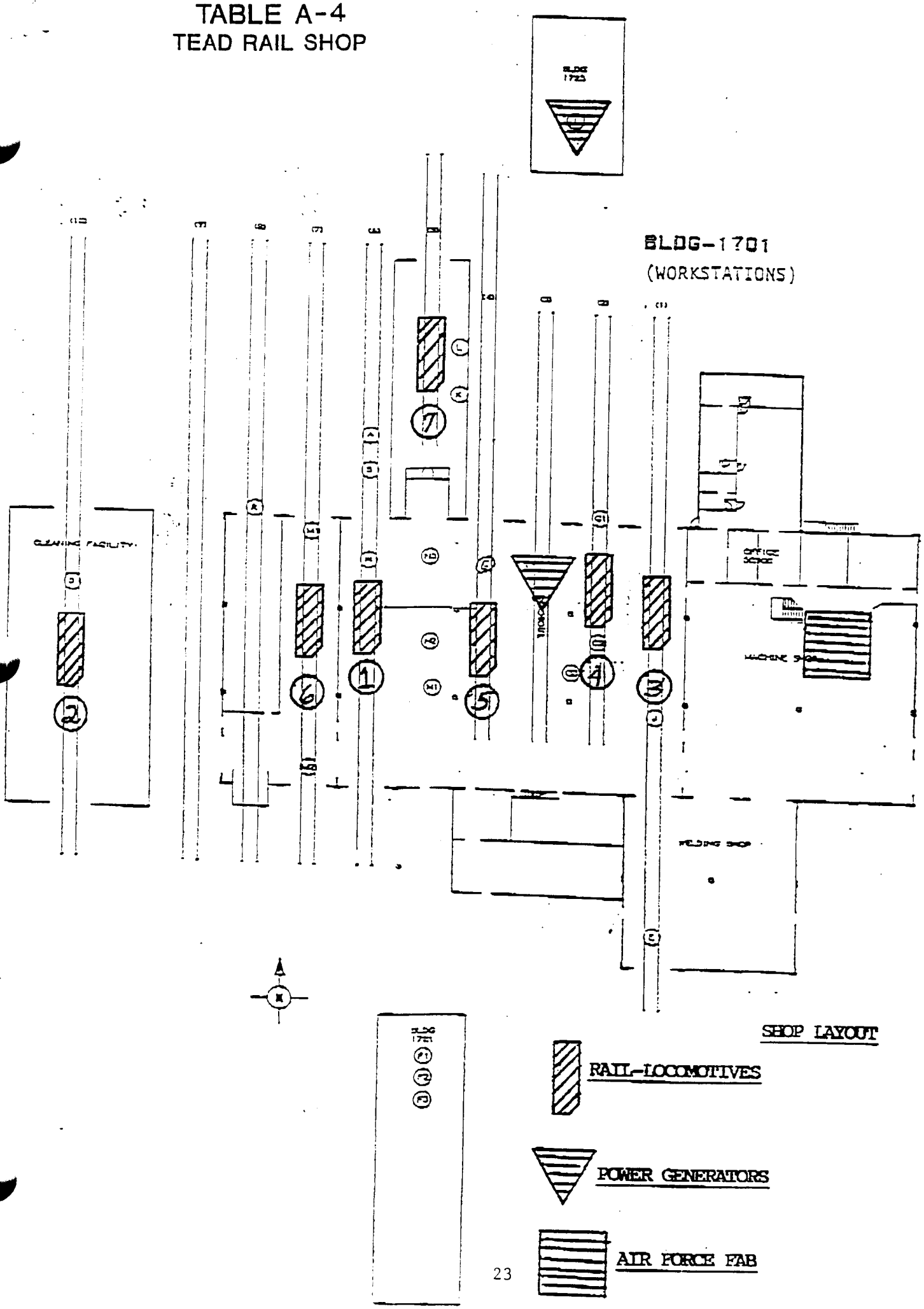


TABLE A-4
TEAD RAIL SHOP



DEPARTMENT OF THE NAVY
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
BUILDING 212, WASHINGTON NAVY YARD
WASHINGTON, D.C. 20374-2121

IN REPLY REFER TO:
11230
122
28 Dec 1990

From: Commanding Officer, Chesapeake Division, Naval Facilities Engineering Command
To: Commander, US Army Troop Support Command, ST Louis, MO (Attn AMSTR-PE)

Subj: LEAD SERVICE STUDY - RAILROAD EQUIPMENT

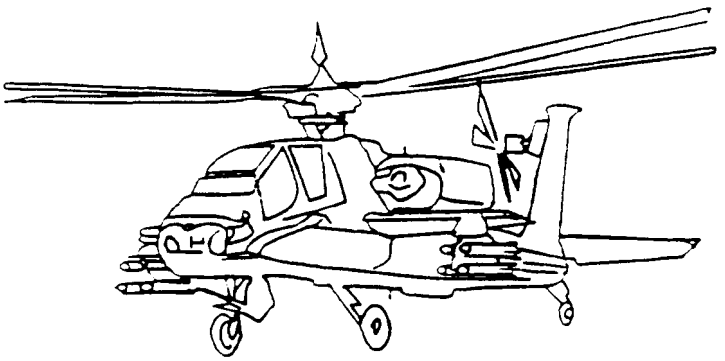
Ref: (a) TROSCOM AMSTR-PE Memorandum of 13 Dec 1990

1. Reference (a) forwarded the final draft of the lead Service Study-Railroad Equipment for review. We concur in the content of this study draft in those areas which address Navy railway equipment. We have no comment on the remainder of the study draft.

Walter Hilsabeck
WALTER HILSABECK
By direction

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Rotary Wing Depot Maintenance Study



Prepared for:

DEFENSE DEPOT MAINTENANCE COUNCIL

31 January 1991
(This Draft Dated 18 December 1990)

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Rotary Wing Depot Maintenance Study

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EXECUTIVE SUMMARY

ROTARY WING DEPOT MAINTENANCE STUDY

1. Reference:

a. Memorandum, Deputy Secretary of Defense, 30 June 1990, subject: Strengthening Depot Maintenance Activities.

b. Memorandum, Office of the Assistant Secretary of Defense for Production and Logistics, 8 August 1990, subject: Defense Depot Maintenance Council Meeting Minutes, 24 July 1990.

c. Headquarters, U.S. Army Materiel Command Maintenance Division tasking during VENUS televideo conference, 26 July 1990.

2. As requested by above references, a multi-service, Rotary Wing Study Team was formed and subsequently met at St. Louis on 9-10 August, 23-30 August and 4-7 September 1990. Team composition included representatives from the Air Force, Navy, Marines and Army. Site visits of team support members included Naval Aviation Depot (NADEP), North Island, CA, Cherry Point, NC, and Corpus Christi Army Depot, TX. The study is summarized below:

The baseline for analysis was established as the Rotary Wing Action Team Final Report, dated 5 April 1990, which was a joint Air Force, Army and Navy effort. A detailed analysis of the recommended consolidations was conducted to include a quantification of:

(1) Cost benefit/savings analysis

(2) Capacity utilization changes

(3) Interservicing changes

In addition, the time frame (FY 90-92 for the April 1990 study) was expanded to account for planned workload from FY 91 thru FY 97. Savings were estimated for force modernization aircraft based on plans to transition from sole source private sector contracts to organic depots. The resultant changes in capacity utilization and interservicing were quantified.

3. Cost, performance, quality, productivity and capacity comparability among Navy depots, Army depots, DOD depots and commercial depots are very difficult because of differences in measurement. The USN lead service effort to develop a comparable performance measurement system (cost, performance, quality and productivity), the USAF "Handbook" to facilitate cost comparability and the USA long-term information management system, would have been helpful in preparing this study, but was unavailable in sufficient detail, at the time of report preparation.

4. Based on current data available, the following major assumptions were made:

a. Performance, quality, productivity, and direct labor costs are roughly equivalent at CCAD, Pensacola, North Island, and Cherry Point.

b. Indirect savings from consolidation of rotary wing work are approximately 16% (number of indirect personnel divided by number of direct personnel identified for separation as a result of consolidation). The 16% is based on minimal data points. Sensitivity analysis varying this parameter from 11% to 25% was conducted and recommended alternatives were relatively insensitive to the variations.

5. Study group consensus partially confirms the previous report that there are no fundamental mission or technical differences in the services' helicopters, as they relate to depot maintenance. Aviation engineering expertise, developed over time at the weapons system level, is not easily transferred among services. Subsystem/component expertise can be transferred with some difficulty. Accordingly, organic rotary wing depot maintenance workload should be consolidated at Army and Navy depots, in consonance with existing depot maintenance interservice support agreements (DMISAs), except as noted below and supplemented by the following guidelines:

a. Army and Navy helicopter workload should be concentrated at CCAD and Pensacola, respectively, to maximize compatibility with service operational requirements and logistic/engineering linkages except as noted:

(1) The H-46 aircraft and component depot programs should be consolidated at NADEP Cherry Point vice Pensacola beginning in FY 91. Cumulative savings for the Cherry Point alternative are $5.78M in FY 97 and -$1.107M for the Pensacola alternative. Initial costs for NADEP Cherry Point are estimated to be $.212M with a per annum savings of $.856M, while costs for Pensacola are $10.0M with per annum savings of $1.309M. The H-46 is a 28 year old system and will most likely be retired within the next 8-10 years, this study group recommends consolidation of H-46 and components at Cherry Point.

(2) The T-58 and T-64 engine programs should be consolidated at NADEP Cherry Point vice CCAD beginning in FY 92. Cumulative savings for the Cherry Point alternative are $3.932M in FY 97 while the CCAD alternative would not realize a savings until FY 2001. Initial costs for NADEP Cherry Point are estimated to be $3.442M with a per annum savings of $1.229M, while costs for CCAD start up are $16.504M with per annum savings of $1.654M. Since a break even for the two alternatives is virtually an infinite point, this study group recommends consolidation of engines at Cherry Point.

b. Air Force helicopter workload should remain split between CCAD and NADEP Pensacola in accordance with existing depot maintenance interservice agreements (i.e., H-1 aircraft and components should remain at CCAD and Air Force aircraft and components [H-3, H-53 and H-60] should remain at NADEP Pensacola).

6. The study team identified 193,941 direct labor hours of planned FY 91 private sector (national maintenance contract) depot maintenance repair work that could be tranferred to CCAD and done at less cost. Assuming transition to the DOD depot system, potential cost avoidance was estimated to be $5.844M in FY 91. Potential savings from FY 91 through FY 98 for transition to organic (limited competition) for the AH-64, CH-47D and UH-60 is $85.2M.

7. Savings associated with the transfer of the T-58, T-64 engines and accessories, the H-46 and components, and transition to organic depot for Force Modernization Rotary Wing Aircraft is $80.212M from FY 91-97. Percent interservice is not affected appreciably by study recommendations. DOD rotary wing depot programs percent interservicing for FY 91 is 18 percent. A sizable investment to modify, move or procure Depot Maintenance Plant Equipment (DMPE) would be required in order to increase interservice. The study group was unable to identify any cost effective shift of workload to increase current interservicing percentages. Physical capacity utilization rates changed significantly upward for CCAD and NADEP Cherry Point. NADEP North Island will realize a significant savings to the rotary wing account based on closure of plant facilities or freeing up

space for other work (i.e., fixed wing). Although not quantified, additional savings will accrue as a result of the Naval Aviation Depots Quarterly Fleet Readiness Support Process, which should shift residual North Island work (Depot Field Teams will remain) to NADEP Pensacola.

8. The study team projects the following total cumulative savings to result from all recommended actions for the period FY 91 through FY 95, and for the additional period FY 96 through FY 97.

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
T-58/T-64 from NI to CP	--	1.229	1.229	1.229	1.229	1.229	1.229
H-46 from NI to CP	.856	.856	.856	.856	.856	.856	.856
Transition/ Limited Competition	5.2	13.4	6.2	8.1	9.9	13.2	14.5
Yearly Total Savings	6.056	15.485	8.285	10.185	11.985	15.28	16.58
Costs	-.212 (H-46)	-3.442 (Eng)					
	5.844	12.043					
Cumulative Savings	5.844	17.887	26.172	36.357	48.342	63.627	80.2

9. Based on available direct labor hours, Navy on-board strength plus 5% temporaries and overtime max of 7% and Army 10% overtime, all depots are at 100% of manpower capacity. Cherry Point can execute recommended workload by shifting direct labor hours and facilities from fixed wing to rotary wing activity. All three Navy depots can trade direct labor hours and physical capacity between rotary and fixed wing accounts. CCAD does not have fixed wing direct labor personnel, therefore, on-board direct labor personnel strength must be increased by 175-200 manyears per year to absorb transition from contract to organic and realize the savings identified. If all of the actions, which the study team recommended were implemented, the projected rotary wing capacity utilization of each of the four depots studied is estimated to be as follows:

	PERCENT						
	FY91	FY92	FY93	FY94	FY95	FY96	FY97
CCAD	85	93	87	86	78	79	79
NADEP Pensacola	76	74	72	72	72	72	72
NADEP North Island	44	26	16	0	0	0	0
NADEP Cherry Point	122	104	94	81	77	78	78

NADEP North Island will remain as the base for regional field depot teams. Note that the above figures show only rotary wing capacity utilization. The three NADEPs also have a fixed wing capacity which this study does not cover.

GARY D. JOHNSON
Colonel, USA
Chairman

THOMAS E. REITER
Colonel, USAF
Team Member

JOHN CARSWELL
Colonel, USMC
Team Member

JERRY GARTMAN
Colonel, USMC
Team Member (Navy)

DEFENSE DEPOT MAINTENANCE COUNCIL
STRENGTHENING DEPOT MAINTENANCE ACTIVITIES

Rotary Wing Depot Maintenance Study

1. Study Methodology

a. Scope: The scope of this study is limited to an analysis of DOD (Army, Navy, USAF and USMC) rotary wing related systems/equipment depot workload and to make recommendations concerning consolidation, downsizing and streamlining for more efficient and cost effective depot operations.

b. Study Assumptions: Cost, performance, quality, productivity, and capacity comparability among Navy depots, Army depots, other DOD depots, and commercial depots are very difficult due to differences in measurement. The USN effort to develop a comparable performance measurement system (cost, performance, quality and productivity), the USAF "Handbook" to facilitate cost comparability and the USA long-term information management system would have been helpful in preparing this study. Based on the current data available, the following major assumptions were made:

(1) Performance, quality, productivity, and direct labor costs are roughly equivalent at CCAD, Pensacola, North Island, and Cherry Point.

(2) Indirect savings from consolidation of rotary wing work are approximately 16% (number of indirect personnel divided by number of direct personnel identified for separation as a result of consolidation). The 16% is based on minimal data points. Sensitivity analysis varying this parameter from 11% to 25% was conducted and recommended alternatives were relatively insensitive to the variations.

c. Study Group Members:

NAME	ASSIGNMENT	ORG	PHONE (DSN)
COL G. Johnson (USA)	Chairman	AVSCOM	693-1042 693-2784(FAX)
COL T. Reiter (USAF)	Principal	AFLC	468-2826 468-4911
COL J. Carswell (USMC)	Principal USMC	HQ USMC	224-1835 224-2131
COL J. Gartman (USMC)	Principal Navy	NADEP-CP	582-7000 582-7118
Mr. Richard Pecht	Member	DESCOM	570-9244 570-9845
LTC(P) Chris Guppy	Member	CCAD	861-2434 861-3126
Mr. Roy Oliver	Member	CCAD	861-3561 861-3126
Ms. Karen Thompson	Member	AVSCOM	693-1011 693-2784
Ms. Janet Hoffman	Member	AVSCOM	693-1957 693-2784
Mr. Chad Divincenzo	Member	AVSCOM	693-1011 693-2784
Mr. Dwayne Young	Member	AVSCOM	693-1042 693-1632
Ms. Alice Nesmith	Member	AFLC	468-7248 468-4911
LTC Marvin Champion	Member	AFLC	468-9342 468-4911
Mr. J.P. O'Brien	Member	NADEP-CP	582-7500 582-7118
Mr. Jim Ruff	Member	NADEP-P	922-2326 922-3244
Mr. Dave Franks	Member	NADEP-P	922-2229 922-3244

d. Site Visits:

(1) Two of the four principles visited NADEP Pensacola, Cherry Point, North Island, and CCAD in March 1990. Additional site visits of team support members included NADEP North Island, Cherry Point and CCAD in August 1990.

(2) Some study group members visited HQ DESCOM 17-21 September 1990 to participate in final preparation of a consolidated service plan for Depot Maintenance of Rotary Wing, Combat/Wheeled Vehicle, Conventional Munition, Rail, GTE Compressors, and General Purpose Equipment.

e. Data Collection: The study team obtained and reviewed available data from numerous sources. The Defense Logistics Studies Information Exchange (DLSIE) provided a custom bibliography, subject: Depot Maintenance on Aircraft (1980 to Present), which included 67 studies. Microfiche of twelve (12) of the most pertinent studies were obtained and reviewed to assist in the analysis and preparation of the DOD Rotary Wing Study. Limited data was also obtained from other DDMC Study Group members to include: JLC/JPCG-DM capacity study, Air Force Cost Comparability Committee, Fixed-Wing Aircraft and Landing Gear Group, and Navy Gas Turbine Engine Group. Numerous data calls were requested and received from NADEP Pensacola, North Island, Cherry Point, and Corpus Christi Army Depot, as well as Army Depot Systems Command, HQ U.S. Marine Corps, and Defense Systems Management College. Other literature reviewed included the 30 June 1990 Deputy Secretary of Defense memorandum, subject: Strengthening Depot Maintenance Activities, the 8 August 1990 Executive Secretary to the Defense Depot Maintenance Council Meeting minutes, previous depot maintenance Defense Management Review Decisions (DMRD), other study team Spring 1990 reports and the Rotary Wing Action Team Final Report dated 5 April 1990. The study team also obtained and reviewed all existing rotary wing Depot Maintenance Interservice Support Agreements (DMISA's).

2. Analysis:

a. Introduction:

The baseline for analysis was established as the Rotary Wing Action Team Final Report, dated 5 April 1990. A detailed analysis of the April report recommended consolidation actions was conducted to include a quantification of cost benefit/ savings analysis, capacity utilization and interservicing.

Current study analysis includes a categorization of Rotary Wing Systems, Maintenance and Support Facilities, Equipment, Skills, Technical Support, Environmental Considerations, Workload (organic, contract, and interservice), Cost Reductions and Efficiencies (changes in utilization and interservicing).

b. Categorizations of Rotary Wing Systems:

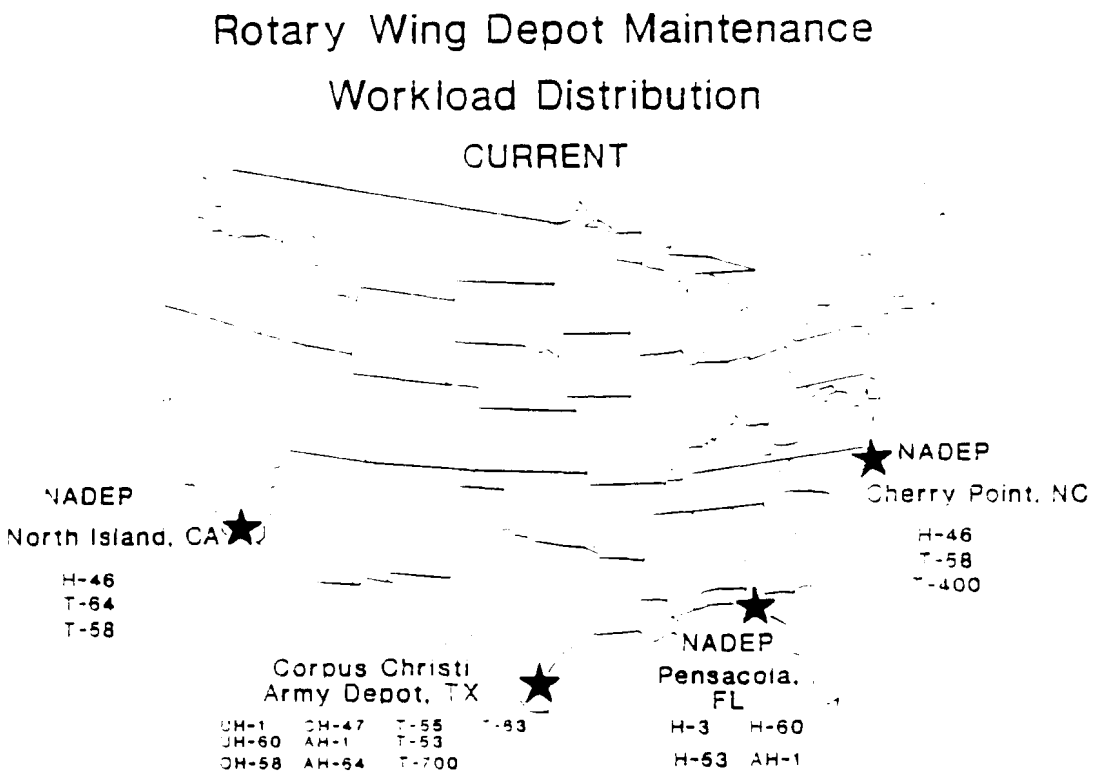
(1) A detailed review by mission design and series was conducted. Mission was categorized as utility, scout, attack or cargo. Additional factors considered were associated contractor or manufacturer, type/number of engines, as well as dynamic component differences. Even though several rotary wing systems appear to be similar and share some common mission and design characteristics, they differ significantly by series when comparing key maintenance drivers (i.e., ATE and Depot Maintenance Plant Equipment). Table 1 depicts the Air Force, Navy, Marines and Army rotary wing systems that were evaluated for depot level maintenance commonality and capability during the course of this study. Table 1A depicts depot locations and assigned overhaul items.

Table 1

Multi-Service Rotary Wing Systems

NAME	MISSION	SERVICE	DEPOT FACILITY	PRIME CONTRACTOR
UH-1/H-1	UTILITY TRANSPORT	ARMY/AIR FORCE NAVY/MARINES	CCAD	BELL
AH-1	ATTACK	MARINES ARMY	CCAD PENSACOLA	BELL
OH-58	SCOUT OBSERVATION	ARMY	CCAD	BELL
AH-64	ATTACK	ARMY	CCAD	MCDONNELL DOUGLAS
UH-60/H-60	UTILITY TRANSPORT	ARMY/AIR FORCE NAVY	CCAD PENSACOLA	SIKORSKY
CH-47D	CARGO TRANSPORT	ARMY	CCAD	BOEING
H-46	CARGO TRANSPORT	NAVY MARINES	CHERRY POINT NORTH ISLAND	BOEING
H-3	CARGO TRANSPORT	NAVY AIR FORCE	PENSACOLA	SIKORSKY
H-53	CARGO TRANSPORT	NAVY AIR FORCE	PENSACOLA	SIKORSKY

Table 1A



(2) Current Depot Maintenance Interservice Support Agreements (DMISAs) were collected and analyzed. Table 2 reflects current DMISAs involving all services. The agent/ maintenance manager, weapon system principal user (customer of the support agreements) and source of repair are identified. Table 3 shows non-DMISA depot level work load drivers. Using service projected depot workload for FY 91-97 percent interservicing by year was calculated. For FY 91 percent interservice for Department of Navy is 4.2%, Department of Army is 15% and Department of Air Force is 91.2%. Overall DOD rotary wing interservice is 18%. Percent interservice (by service) for all years, is shown in Tables 4, 5 and 6.

Table 2

Depot Maintenance Inter-Service Support Agreement (DMISA) Workload

Weapon System	Agent Maintenance Manager	Principle User	Source of Repair
T-700 Engine	Army	Air Force	CCAD
T-53 Engine	Army	Air Force	CCAD
H-1 & Components	Army	Air Force	CCAD
TF-40B Engine	Army	Navy/Coast Guard	CCAD
H-1, T-53 Engine & Components	Army	Navy	CCAD
T-62 Engine & Components	Navy	Army	NADEP, CHERRY POINT
Misc Army Aircraft Components	Navy	Army	NADEP, CHERRY POINT
Flight Instrument	Air Force	Army	Robins ALC
Misc Army Aircraft Components	Navy	Army	NADEP NORFOLK
Pneumatic Accessories	Air Force	Army	Tinker ALC
Army Acft Component	Navy	Army	NADEP, PENSACOLA
H-53, H-60, H-3	Navy	Air Force	NADEP, PENSACOLA

Table 3

Rotary Wing Depot Maintenance
Non-DMISA Workload

Workload	Location of Depot Maintenance
Airframe/Engine/Component	
- AH-1 (Cobra)	CCAD (Pensacola AH-1W)
- AH-64 (Apache)	CCAD
- CH-47 (Chinook)	CCAD
- OH-58 (Kiowa)	CCAD
- UH-60 (Blackhawk)	CCAD (Pensacola H-60)
- H-53 (Sea Stallion)	NADEP, Pensacola
- H-46 (Sea Knight)	NADEP, Norfolk & Cherry Pt
- H-3 (Jolly Green Giant)	NADEP, Pensacola
Miscellaneous/Ground Spt Equip	ANAD, LBAD, LEAD, RRAD, TEAD, TOAD, SAAD (see NOTE 1)
- Containers	
- Test Equipment	
- Indicators	
- Transportability Kits	

NOTE 1 - Misc aviation workload at other organic depots makes up approximately 2% of Army rotary wing organic depot level maintenance. This workload requires minimum system peculiar DMPE and utilizes existing capability/facilities common to other system/ commodities.

c. Workload Analysis:

(1) The first step in analyzing rotary wing depot level maintenance was to evaluate all currently planned workload. This workload for FY 91 through FY 97 is displayed by service in tables 4, 5, and 6. Each table splits the service's total workload into organic, contract, and interservice work. Eighty million dollars of reimbursables (FMS, State and Treasury Dept, etc, are reflected in Table 6 as interservice workload. Reimbursables for Tables 4 and 5 are also included.

(2) All depots operate primarily on a 1-10-4 or 1-8-5 shift. The Navy facilities use existing authority of up to 5% temporaries and an overtime maximum of 7% to execute workload. CCAD has historically executed programs using a 10-11% overtime authority. The baseline of percent capacity is relatively fixed at CCAD; the other three depot facilities have both a fixed wing and rotary wing depot mission capacity and can, within reason, be traded between the two accounts.

(3) Maximum capacity is defined in terms of direct manhours (1615/person/year x .95) that are calculated based on the maximum number of direct labor personnel that can effectively work in a single shift within the associated shop category. The currently projected capacity utilization for each of the four depots based upon the workload in tables 4, 5, and 6 is shown in Appendix A, Tables A-5 through A-11.

Table 4

Navy Rotary Wing Workload Distribution

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
Organic	73.8	177.8	73.5	179.6	72.8	186.7	73.0	196.6	67.7	182.3	71.1	210.1	70.6	207.8
Contract	22.1	53.4	22.3	54.5	23.8	61.1	23.0	61.6	26.8	72.1	26.1	74.2	26.7	75.7
Inter-Service	4.2	10.2	4.2	10.3	3.4	8.7	4.0	10.8	5.5	14.9	3.7	11.0	3.7	11.0
Total $	241.2		244.4		256.5		267.9		269.3		296.3		294.5	
Total Manhours (000's)	2.082		2.125		2.249		2.296		2.091		2.379		2.298	

Table 5

Air Force Rotary Wing Workload Distribution

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
Organic	.8	0.42	.8	.36	.8	.28	.8	.25	.8	.23	.5	.25	.8	.23
Contract	8	4.2	16	7.3	31	10.7	33	10.4	37	10.7	31	9.9	34	9.9
Inter-Service	91.2	48.3	83	36.5	68	24.3	66	21.	62	18.	69	22.	66	19.0
Total $	53M		44M		35M		32M		29M		32M		29M	
Total Manhours (000's)	812		670		497		472		453		497		453	

Table 6

Army Rotary Wing Workload Distribution

	FY91		FY92		FY93		FY94		FY95		FY96		FY97	
	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M	%	$M
Organic	48	275.1	48	308.9	50	266.3	48	243.8	46	208.8	46	208.8	46	208.8
Contract	37	216.0	38	246.6	34	183.4	35	175.5	35	159.9	35	159.9	35	159.9
Inter-Service	15	85.7	14	86.4	1 16	85.6	17	85.1	19	84.6	19	84.6	19	84.6
Total $	676.8		641.1		534.3		504.4		453.3		453.3		453.3	
Total Manhours (000's)	5,675		6,031		5,399		6,129		4,607		4,607		4,607	

d. Maintenance and Support Facilities:

(1) An in-depth assessment of rotary wing depot facilities was conducted following site visits in March 1990. The chairman of the current study and one principal team member participated in original site surveys. Additional visits were made by team support members in August, to NADEP Cherry Point, North Island and Corpus Christi Army Depot with the express purpose of quantifying cost to implement proposed consolidations.

(2) All four depot facilities can be categorized as originally being built for fixed wing depot maintenance. All are near major water ports, and all but Cherry Point are in close proximity to commercial aviation facilities. The three Navy facilities still have fixed wing depot operations. CCAD has been a "rotary wing only" depot facility since the early 1960s and, generally speaking, is more compact with regards to dispersion of work centers, than the three Navy facilities.

(3) Both CCAD and Pensacola have new modern blade repair/overhaul facilities. All four depots have rotary wing whirl-towers and Pensacola has the newest state-of-the-art tower. All have dedicated collocated supply facilities. Although all have some Automated Supply and Retrieval System (ASRS) capability, CCAD's new system is modern, state-of-the-art with extensive capability. Cherry Point has a unique, highly capable new blade and vane repair facility as well as a new plating facility. CCAD has the only complete airframe plastic media blasting capability and has just opened a new airframe disassembly hangar and robotic painting facility.

e. Equipment: An analysis of the rotary wing maintenance support equipment at all four depots shows no engine capability at Pensacola, but a rather extensive airframe electrical capability and the most modern blade whirl-tower. CCAD has an extensive engine and transmission/gear box capability as well as a modern rotor blade repair/overhaul facility. Cherry Point's capability for Navy rotary wing engines and transmission exceeds North Island's. A listing of rotary wing major repair/test equipment is shown by depot, on Table 7.

Table 7

Rotary Wing Support Equipment

		CCAD	Cherry Point	North Island	Pensacola
UH-1/AH-1	Eng cell	8	2	-	-
	XMSN/GB	4	5	-	4
CH-47	Eng cell	8	-	-	-
	XMSN	3	-	-	-
UH-60	Eng cell	2	-	-	-
	XMSN	2	-	-	1
AH-64	Eng cell	2	-	-	-
	XMSN	3	-	-	-
OH-58	Eng cell	2	-	-	-
	XMSN	2	-	-	-
CH-46	Eng cell	-	2	1	-
	XMSN	-	1	1	-
H-2	Eng cell	-	2	1	-
	XMSN	-	1	1	1
H-3	Eng cell	-	2	1	-
	XMSN	-	1	1	1
CH-53	Eng cell	-	-	1	-
	XMSN	-	-	-	2
OH-6	Eng cell	2	-	-	-
	XMSN	2	-	-	-
OTHER	Whirltower	1	1	1	1
	DITMCO	1	-	-	4

f. Skills: Shown on Table 8 is the April 1990 mix of repair skills and number of direct labor personnel employed at each depot facility. Generally speaking, all locations have been successful in acquiring the required number of skilled personnel from local labor pools. Consensus is that availability of skilled people is not a variable that impacts proposed consolidations.

Table 8

Rotary Wing

Baseline Repair Skills

SKILLS	CCAD	NADEP NORTH ISLAND	NADEP CHERRY POINT	NADEP PENSACOLA
AIRFRAMES	689	66	81	405
ENGINES	360	58	56	2
DYNAMIC COMPONENTS	223	74	52	222
ACCESSORIES AND SMALL COMPONENTS	408	39	48	109
ELECTRONIC/COMM/ ARMAMENT SYSTEMS	59	1	3	173
MANUFACTURE AND REPAIR	344	14	40	211
TEST AND CALIBRATION	51	3	1	98
OTHER DIRECT SUPPORT	48	55	19	50

g. Technical Support: There are no significant differences in the technical support among the four depots. All have CAD/CAM technology, provide a wide variety of field support functions, and have resident in-service engineering support.

h. Environmental Considerations: At all four depots, environmental management programs operate all missions and related activities in compliance with state and federal regulatory requirements. A concern that impacts all locations is disposal of toxic chemical waste. Primary concerns are plating of rotary wing components and disposal of chemical paint stripping compounds. CCAD is the only depot that has implemented airframe plastic media blasting to reduce the amount of toxic chemical waste that is generated.

3. Efficiencies and Cost Reductions:

a. The study team conducted a cost/benefit analysis of four alternative consolidations of depot maintenance. Two of these alternatives had previously been recommended in the April 1990 Rotary Wing Action Team Final Report, but a detailed cost benefit analysis had not been done at that time. The two other alternatives are being considered for the first time in this study. The alternatives are as follows:

(1) Move rotary wing engine repair now being done at NADEP Cherry Point (T-400/STLT-74 and T-58 engines) and at NADEP North Island (T-64 and T-58 engines) to CCAD.

(2) Move rotary wing engine repair now being done at NADEP North Island to NADEP Cherry Point.

(3) Move H-46 airframe and component repair now being done at NADEP North Island and NADEP Cherry Point to NADEP Pensacola.

(4) Move H-46 airframe and component repair now being done at NADEP North Island to NADEP Cherry Point.

b. Table 9 lists the methodology and assumptions that were used to estimate projected costs and savings for each alternative.

Table 9

Rotary Wing
SAVINGS COMPUTATION

METHODOLOGY AND ASSUMPTIONS

- Cost Analysis - FY90 Dollars
  - •• Personnel
    - ••• Average Salary $32K
    - ••• Separation $ 9K
    - ••• PCS Cost (Included in Separation Cost)
  - •• Includes Equipment Transfers, Facilities Modifications and Transition Management
  - •• Merger Efficiency Reduction
    - ••• Indirect 16%
  - •• Supply Support Ratio to Maintenance Support
    - ••• Equal at all locations

c. Engine consolidation:

(1) Tables 10 and 11 provide the analysis of the estimated savings for the alternative of consolidating engine workload at CCAD. The savings are projected for personnel and facility operating cost reductions.

Table 10

Estimated Savings to Move Rotary Wing Engine Workload from North Island & Cherry Point to CCAD

$ IN MILLIONS

SAVINGS:	FY92	FY93	FY94	FY95	FY96
SPACES	30	-	-	-	-
SALARY	.96	.96	.96	.96	.96
FACILITIES	.694	.694	.694	.694	.694
TOTAL	1.654	1.654	1.654	1.654	1.654
COSTS:					
SEPARATION	.270	-	-	-	-
EQUIPMENT	5.667	-	-	-	-
FACILITIES	8.025	-	-	-	-
TRANSITION	2.542	-	-	-	-
TOTAL	16.504	-	-	-	-
NET SAVINGS	-14.85	-13.196	-11.542	-9.888	-8.234

$ IN MILLIONS

Table 11

SAVINGS:	FY97	FY98	FY99	FY00	FY01
SPACES	-	-	-	-	-
SALARY	.96	.96	.96	.96	.96
FACILITIES	.694	.694	.694	.694	.694
TOTAL	1.654	1.654	1.654	1.654	1.654
COSTS:					
SEPARATION	-	-	-	-	-
EQUIPMENT	-	-	-	-	-
FACILITIES	-	-	-	-	-
TRANSITION	-	-	-	-	-
TOTAL	-	-	-	-	-
NET SAVINGS	-6.58	-4.926	-3.272	-1.618	+.036

(2) Tables 12 and 13 provide the analysis of the estimated savings for consolidating engine workload at NADEP Cherry Point.

Table 12

Estimated Savings to Move Navy Rotary Wing Engine Workload from North Island to Cherry Point

$ IN MILLIONS

SAVINGS:	FY92	FY93	FY94	FY95	FY96
SPACES	20	-	-	-	-
SALARY	.640	.640	.640	.640	.640
FACILITIES	.589	.589	.589	.589	.589
TOTAL	1.229	1.229	1.229	1.229	1.229
COSTS:					
SEPARATION	.180	-	-	-	-
EQUIPMENT	.412	-	-	-	-
FACILITIES	1.291	-	-	-	-
TRANSITION	1.559	-	-	-	-
TOTAL	3.442	-	-	-	-
NET SAVINGS	-2.213	-.984	+0.245	+1.474	+2.703

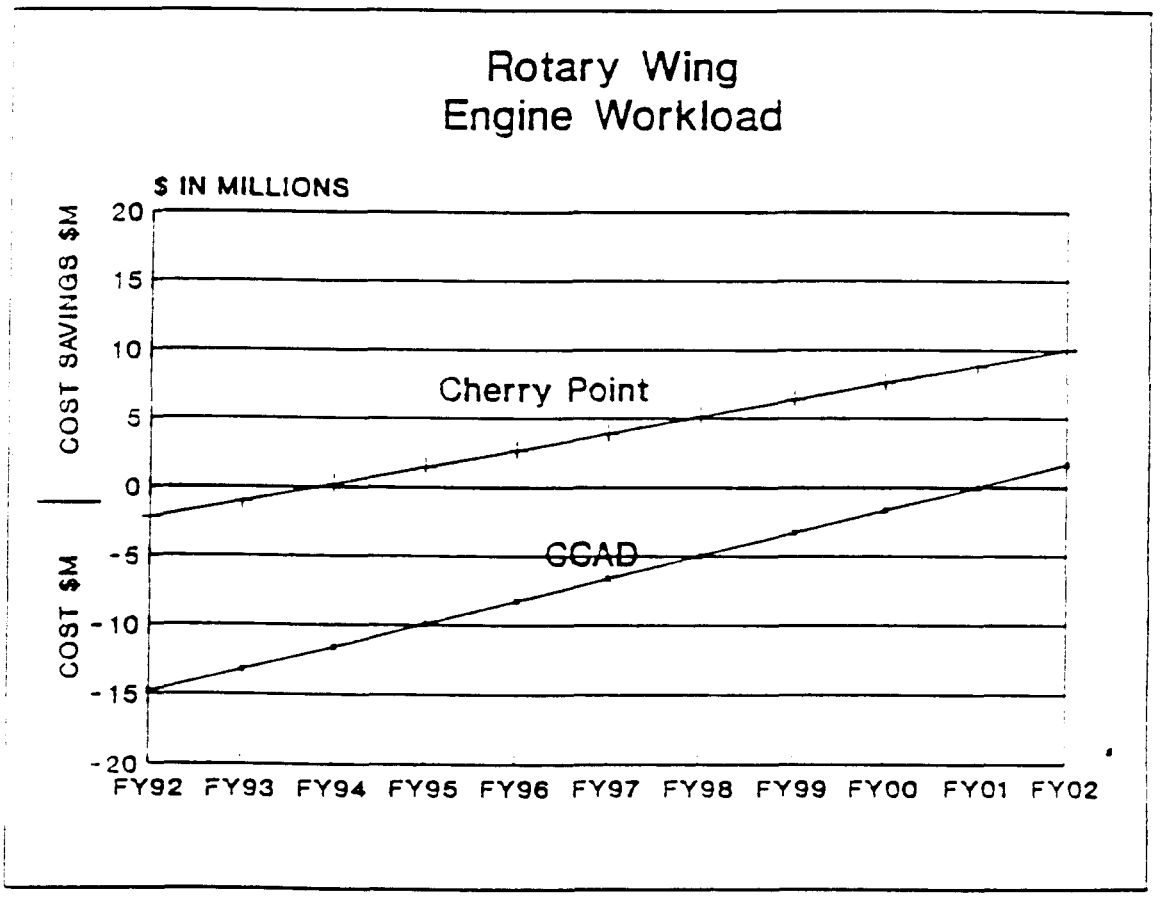
$ IN MILLIONS

Table 13

SAVINGS:	FY97	FY98	FY99	FY00	FY01
SPACES	-	-	-	-	-
SALARY	.640	.640	.640	.640	.640
FACILITIES	.589	.589	.589	.589	.589
TOTAL	1.229	1.229	1.229	1.229	1.229
COSTS:					
SEPARATION	-	-	-	-	-
EQUIPMENT	-	-	-	-	-
FACILITIES	-	-	-	-	-
TRANSITION	-	-	-	-	-
TOTAL	-	-	-	-	-
NET SAVINGS	+3.932	+5.161	+6.39	+7.619	+8.848

(3) Table 14 graphically depicts the two engine workload consolidation alternatives; their costs and cumulative savings from FY 92 through FY 02. The total estimated savings for the Cherry Point alternative is $1.474M for the period FY 91 to FY 95. For the period FY 96 through FY 97, a total of $2.458M is estimated, for a grand total of $3.932M (FY 91 through FY 97).

Table 14



d. H-46 consolidation:

(1) Tables 15 and 16 below provide the analysis of the estimated savings for the alternative of consolidating H-46 workload at NADEP Pensacola.

Table 15

Estimated Savings to Move Navy H-46 and Components Workload from North Island & Cherry Point to Pensacola

$ IN MILLIONS

SAVINGS:	FY91	FY92	FY93	FY94	FY95
SPACES	22	-	-	-	-
SALARY	.704	.704	.704	.704	.704
FACILITIES	.605	.605	.605	.605	.605
TOTAL	1.309	1.309	1.309	1.309	1.309
COSTS:					
SEPARATION	.198	-	-	-	-
EQUIPMENT	4.057	-	-	-	-
FACILITIES	5.30	-	-	-	-
TRANSITION	.450	-	-	-	-
TOTAL	10.0	-	-	-	-
NET SAVINGS	-8.691	-7.382	-6.343	-5.034	-3.725

$ IN MILLIONS

Table 16

SAVINGS:	FY96	FY97	FY98	FY99	FY00
SPACES		-	-	-	-
SALARY	.704	.704	.704	.704	.704
FACILITIES	.605	.605	.605	.605	.605
TOTAL	1.309	1.309	1.309	1.309	1.309
COSTS:					
SEPARATION		-	-	-	-
EQUIPMENT		-	-	-	-
FACILITIES		-	-	-	-
TRANSITION		-	-	-	-
TOTAL		-	-	-	-
NET SAVINGS	-2.416	-1.107	+.202	+1.511	+2.820

(2) Table 17 below provides the analysis of the estimated savings for consolidating H-46 workload at NADEP Cherry Point.

Table 17

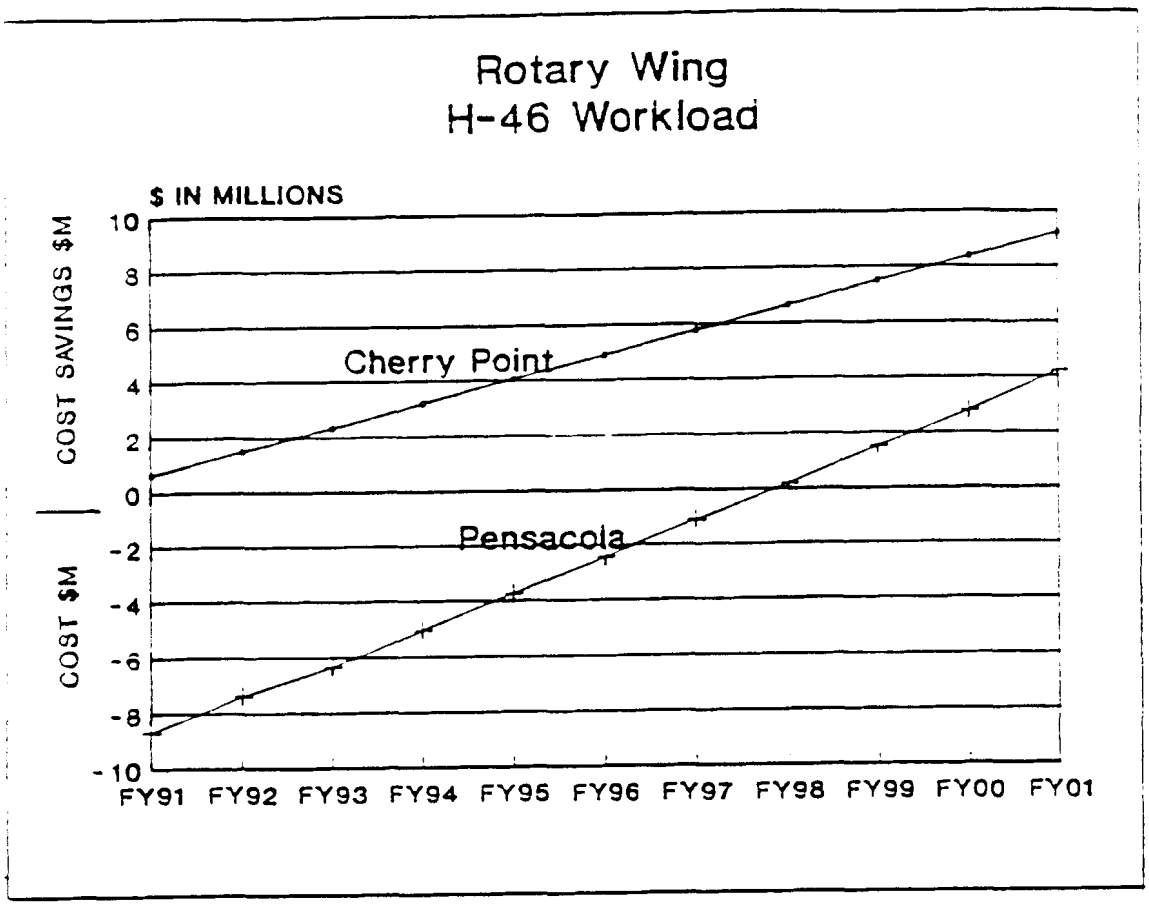
Estimated Savings to Move Navy H-46 and Component Workload from North Island to Cherry Point

$ IN MILLIONS

SAVINGS:	FY91	FY92	FY93	FY94	FY95
SPACES	11	-	-	-	-
SALARY	.352	.352	.352	.352	.352
FACILITIES	.504	.504	.504	.504	.504
TOTAL	.856	.856	.856	.856	.856
COSTS:					
SEPARATION	.099	-	-	-	-
EQUIPMENT	.012	-	-	-	-
FACILITIES	.100	-	-	-	-
TRANSITION	.001	-	-	-	-
TOTAL	.212	-	-	-	-
NET SAVINGS	+.644	+1.5	+2.356	+3.212	+4.068

(3) Table 18 graphically depicts the two H-46 consolidation alternatives; their cost and cumulative savings from FY 91 through FY 01. The total estimated savings for the Cherry Point alternative is $4.068M for the period FY 91 to FY 95. For the period FY 96 through FY 97, an additional $1.712M in savings is estimated, for a grand total of $5.78M (FY 91 through FY 97).

Table 18



e. Force Mod Transition/Limited Competition: In addition to examining the preceding alternatives, the study team examined potential savings from transitioning depot level repair work from the private to the public sector (limited competition). Team members screened Army FY 91 national maintenance contract (private sector) work to determine whether DOD organic (public sector) capability for this work existed. They identified 193,941 direct labor hours, covering repair of multiple components, for transition from the private to the public sector. The study team identified CCAD as the best location to take over this work. Based on FY 89 direct labor rates of prime and original equipment manufacturers (primarily Sikorsky and McDonnell Helicopter), the study team identified a cost avoidance of $5.2M for FY 91, and a total of $42.8M for the period FY 91 through FY 95. For the period FY 96 through FY 97, an additional $27.7M is estimated to accrue, for a total of of $70.5M (FY 91-FY 97). To implement this recommendation, CCAD would have to add an additional 175 to 200 direct labor manyears per year to its existing personnel. The reason for this is as follows:

(1) Capacity utilization rates are calculated from the maximum number of direct labor personnel that can work effectively in a single shift at the available work stations within a facility. This does not mean that the facility has employed sufficient direct labor personnel to man all available work stations.

(2) CCAD, like the other depots studied, does not in fact employ enough direct labor personnel to man all available work stations, however, it is using its available personnel at 100% or more (overtime) to handle its current workload.

(3) Manning levels not physical capacity explain why CCAD, which has a current capacity utilization of 72%, would require an additional 175 to 200 direct labor manyears per year to accommodate the recommended increases in workload resulting from the transfer of current private contract repair work into the depot.

f. Competition: The study team attempted to quantify savings accrued from future full and open competition initiatives for all services, in addition to those previously presented as Army Force Modernization Transition/Limited Competition ($18.0M FY 91-FY 95). The team was unable, based on uncertainty associated with the timing and implementation of intitiatives, to quantify concrete, auditable savings.

4. Conclusions.

a. As previously noted, the starting point for this study was the April 1990 Rotary Wing Action Team Final Report. In the course of this study, team members reevaluated many of the conclusions of that report. Table A-1 (Appendix A) summarizes the results of this reevaluation. The conclusions of the current study team are as follows:

(1) Engineering expertise to support the repair of weapon systems is not easily transferred from one location to another. It is easier, though still relatively difficult, to transfer subsystem or component expertise.

(2) Army and Navy rotary wing workload should be concentrated at Corpus Christi Army Depot (CCAD), Corpus Christi, Texas; and Naval Aviation Depot (NADEP) Pensacola, Florida respectively. This will maximize compatibility with service operational requirements and logistics/engineering linkages. In two cases this general policy should not be followed:

(a) Depot repair of the T-58 and T-64 engines now being done at NADEP North Island should be moved to NADEP Cherry Point beginning in FY 92. This move will result in cumulative savings of $1.474M for the period of FY 92 through FY 95, and an additional savings of $2.458M for the period FY 96 and FY 97 for a total savings of $3.392M. (This recommendation differs from the Rotary Wing Action Team Final Report, which recommended moving the work to CCAD. Cost benefit analysis showed that moving the work to CCAD required a nearly five times larger intital investment, with no significant annual savings).

(b) Depot repair of the H-46 rotary wing aircraft and components currently done at NADEP North Island should be moved to NADEP Cherry Point, in FY 91. The H-46 is a twenty year old system that will most likely be retired in the next eight to ten years. Moving the repair to NADEP Cherry Point will result in cumulative cost savings of $4.068M for the period FY 91 through FY 95, and an additional savings of $1.712M for the period FY 96 through FY 97 for a total savings of $5.78M. (This recommendation differs from the Rotary Wing Action Team Final Report, which recommended moving the work to NADEP Pensacola. Cost/benefit analysis showed that the current recommendation provides greater savings).

b. Air Force rotary wing workload should remain split between CCAD and NADEP Pensacola in accordance with existing DMISAs. Air Force H-3, H-53, and H-60 aircraft should remain at Pensacola, and other aircraft and components should remain at CCAD.

c. Moving the Navy rotary wing engine repair and the H-46 airframe and component repair now being done at NADEP North Island to NADEP Cherry Point, will provide the greatest savings of the consolidation alternatives considered.

d. Cost avoidances for the years FY 91 through FY 97 and beyond can be realized if depot level repair done through national maintenance contracts is transitioned to CCAD. This transitioning will also increase CCAD capacity utilization. Implementing this recommendation would, however, require that CCAD increase its personnel strength by 175 to 200 manyears of direct labor per year.

5. Recommendations.

a. This study recommends that the following actions be taken:

(1) Move rotary wing T-58 and T-64 engine repair now being done at NADEP North Island on T-58 and T-64 engines to NADEP Cherry Point.

(2) Move H-46 airframe and component repair now being done at NADEP North Island to NADEP Cherry Point.

(3) Transition depot repair work identified by the study team from national maintenance contract to CCAD. Successful transition depends on programmed DMPE funding of $36M being made available and an increase of 175-200 direct labor manyears at CCAD.

b. If all of the actions which the study team recommeded were implemented, the projected rotary wing capacity utilization of each of the four depots is estimated to be as follows:

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
CCAD	85	93	87	86	78	79	79
NADEP Pensacola	76	74	72	72	72	72	72
NADEP North Island	44	26	16	0	0	0	0
NADEP Cherry Point	122	104	94	81	77	78	78

Note that the above figures show only rotary wing capacity utilization. The three NADEPs also have a fixed wing capacity which this study does not cover.

c. The study team projects the following total cumulative savings to result from all recommeded actions for the period FY 91 through FY 95, and for the additional period FY 96 through FY 97.

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
T-58/T-64 from NI to CP (Table 12)	--	1.229	1.229	1.229	1.229	1.229	1.229
H-46 from NI to CP (Table 17)	.856	.856	.856	.856	.856	.856	.856
Transition/ Limited Competition	5.2	13.4	6.2	8.1	9.9	13.2	14.5
Yearly Total							
(Savings)	6.056	15.485	8.285	10.185	11.985	15.28	16.58
(Costs)	-.212 (H-46)	-3.442 (Eng)					
	5.844	12.043					
Cumulative Savings	5.844	17.887	26.172	36.357	48.342	63.627	80.2

APPENDIX A

The tables in this appendix portray the results of the actions recommeded by this study team. The tables are as follows:

Table A-1. This table shows an evaluation of the assumptions from the April 1990 study and provides corresponding conclusions.

Table A-2. This table categorized the efficiencies and cost reductions that the recommended actions would achieve.

Table A-3. This map shows the depot workload distribution that would result from the recommeded actions.

Table A-4. This table portrays the total savings that would result from implementing the recommended actions from FY 91 through FY 97.

Table A-5. This table shows the FY 91 projected capacity utilization of each of the four depots examined in the study that would result from the recommended actions being implemented.

Table A-6. This table shows projected capacity utilization for FY 92.

Table A-7. This table shows projected capacity utilization for FY 93.

Table A-8. This table shows projected capacity utilization for FY 94.

Table A-9. This table shows projected capacity utilization for FY 95.

Table A-10. This table shows projected capacity utilization for FY 96.

Table A-11. This table shows projected capacity utilization for FY 97.

Table A-1

DDMC Rotary Wing Depot Study Conclusions

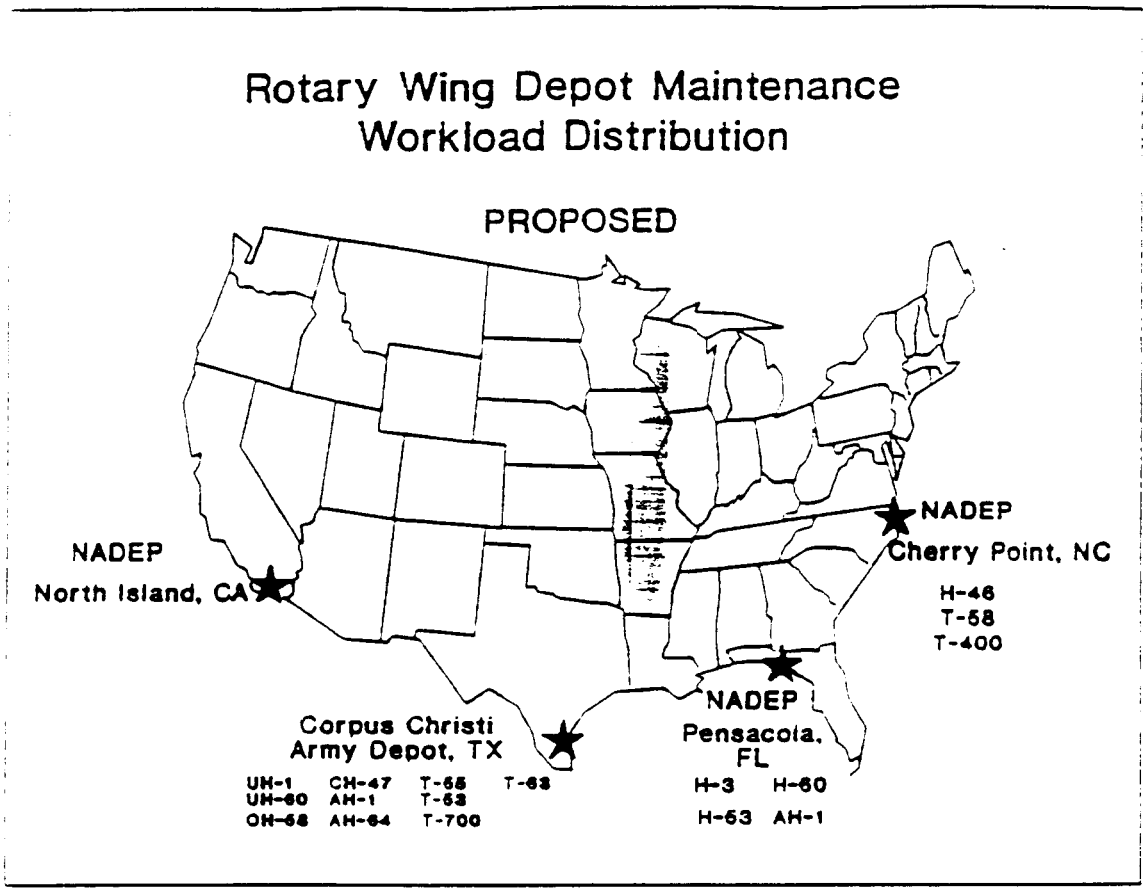
5 Apr 90 Final Report	1 Oct 90 Study
- NO FUNDAMENTAL MISSION OR TECHNICAL DIFFERENCES IN SERVICES (DEPOT)	- Partially confirmed. Weapon system engineering expertise not easily exported. Subsystem/comp difficult but can be consolidated.
- ORGANIC ROTARY WING DEPOT WORKLOAD CONSOLIDATION AT CCAD AND NADEP PENSACOLA	- Partially confirmed. Consolidation at CCAD, NADEP Pensacola and Cherry Point.
- ARMY HELICOPTER WORKLOAD CONCENTRATED AT CCAD	- Confirmed.
- NAVY HELICOPTER WORKLOAD CONCENTRATED AT PENSACOLA	- Partially confirmed. Increasing capacity at Cherry Point is more cost effective than creating capability/capacity at CCAD and Pensacola for engines & accy and H-46 & components.
- AF WORKLOAD NO CHANGE	- Confirmed.
- ENGINE AND ACCESSORIES - CCAD	- Rejected. To Cherry Point (more cost effective).
- LANDING GEAR AND RELATED MANUFACTURING - PENSACOLA	- Deferred to Landing Gear DDMC Team.
- COMPONENTS POSTURED WITH ASSOCIATED TYPE/MDS AIRCRAFT	- Confirmed. Demand/capacity constraints may dictate dual sources when capability exists.
- AFTER REPOSTURING, CCAD/ PENSACOLA WOULD STILL BE UNDERUTILIZED <85%. LOOK AT COMMERCIAL TO ORGANIC	- Partially confirmed. All depots have workload for 100% utilization of current manhours. Manhour availability will drive transition.
- REPOSTURING TWO YR PERIOD - FY91 NOJSLAND: ACFT/COMP CHERRY PT: ENG/ACC - FY92 NOJSLAND: ENG/ACC CHERRY PT: ACFT/COMP	- Rejected. H-46/components to Cherry Point from North Island FY91 Engines/accessories to Cherry Point FY92.
- COMMERCIAL TO ORGANIC TO EXTENT POSSIBLE	- Confirmed. Labor hours and cost savings identified FY91-98 for transition from contract to organic. Percent organic utilization increases quantified.
- SERVICES TASKED TO EVALUATE COSTS/BENEFITS - IDENTIFY TANGIBLE SAVINGS	- 1 Oct 90 Study accomplishes this recommendation.

Table A-2

Rotary Wing Efficiencies/Cost Reductions Thru Streamlining/Realignment

Item/System	Depot	Consolidation	Down Sizing	Inter Service	Public/ Private
H-46 and Components	NADEP Cherry Point	YES	NADEP North Island	N/A	YES/NO
Engines (T-58, T-64)	NADEP Cherry Point	YES	NADEP North Island	N/A	YES/NO
Force Mod Transition	CCAD	YES	Private Sector	N/A	YES/ SOLE SOURCE

Table A-3



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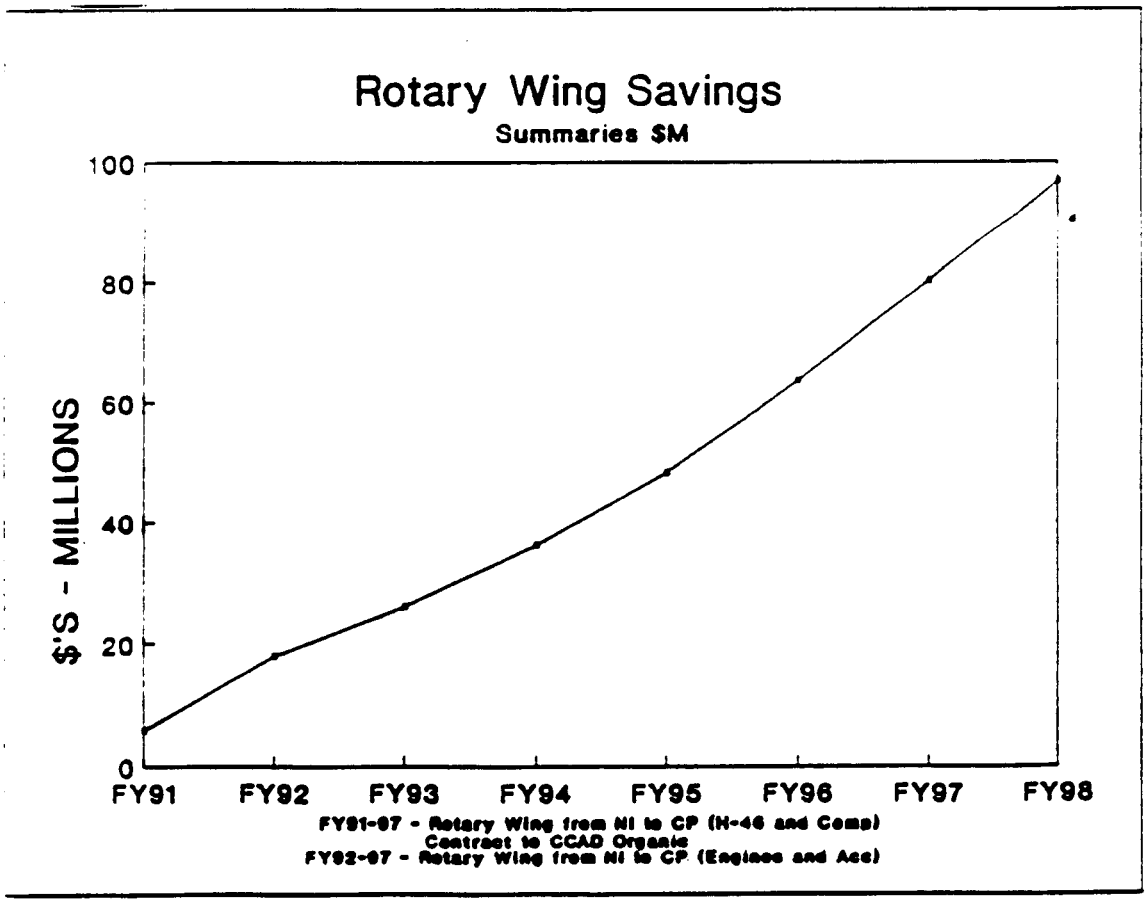

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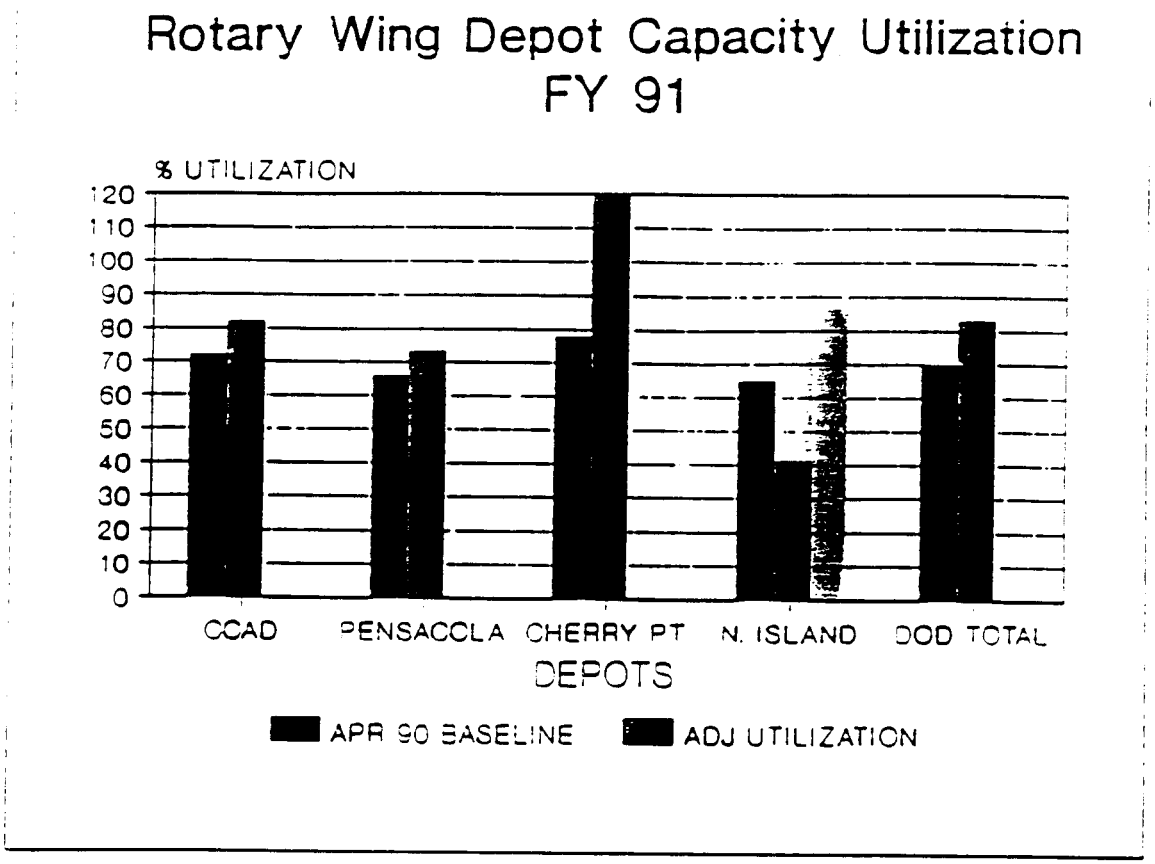

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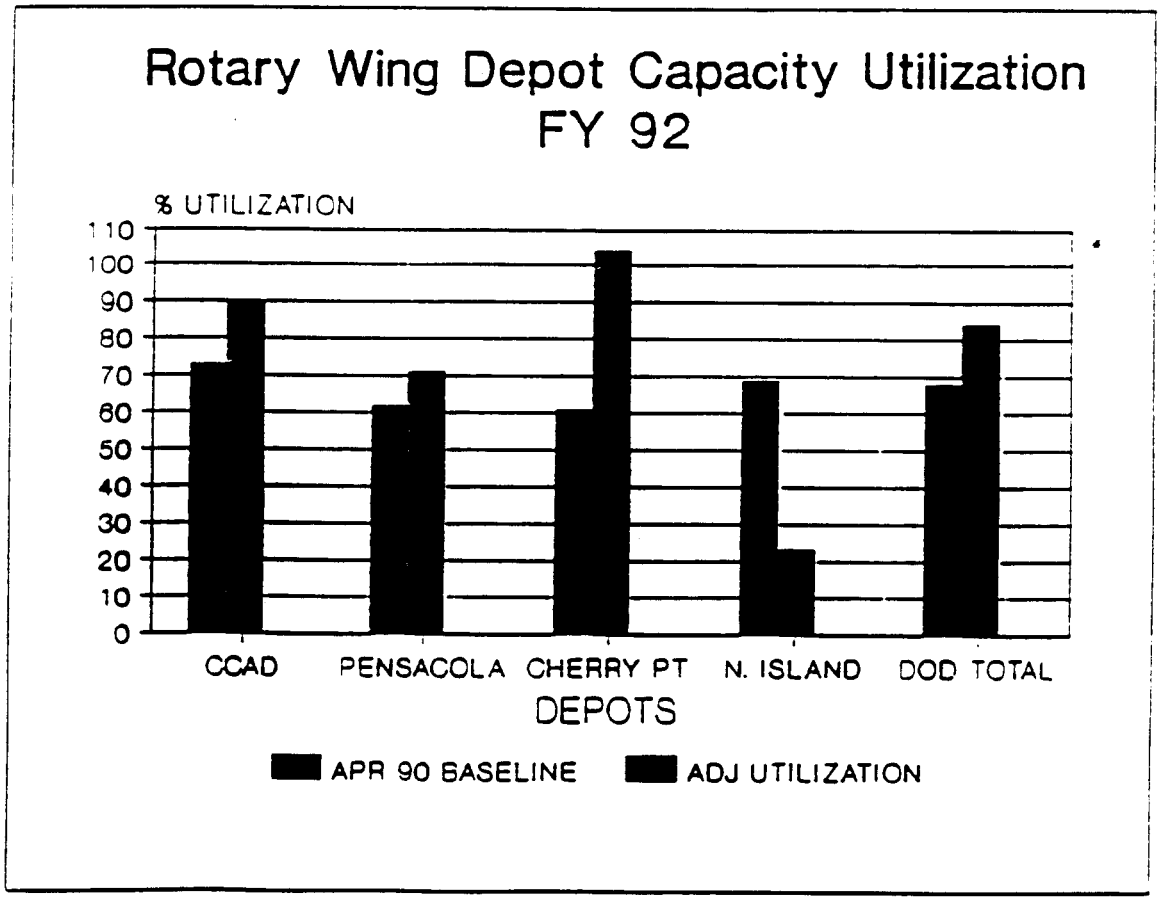

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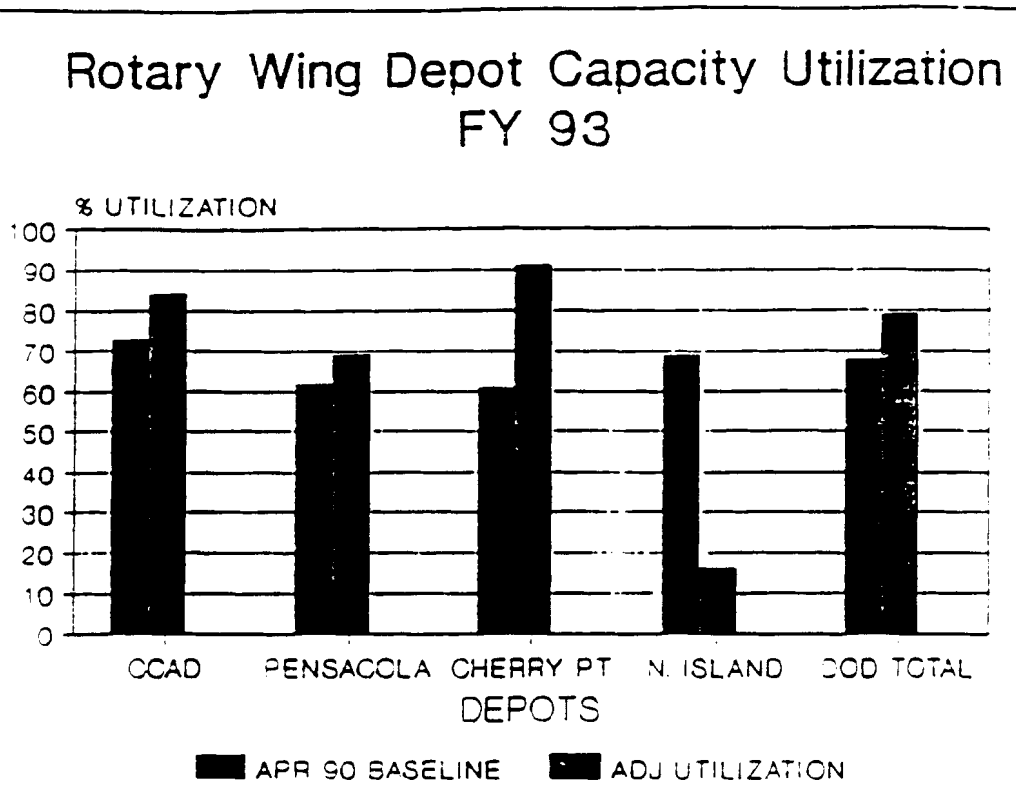

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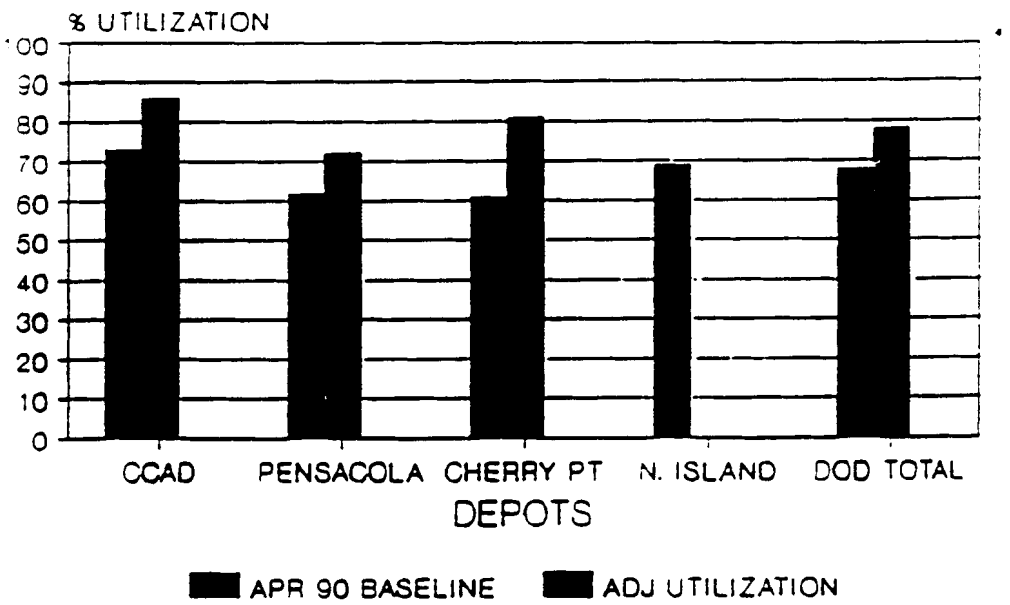

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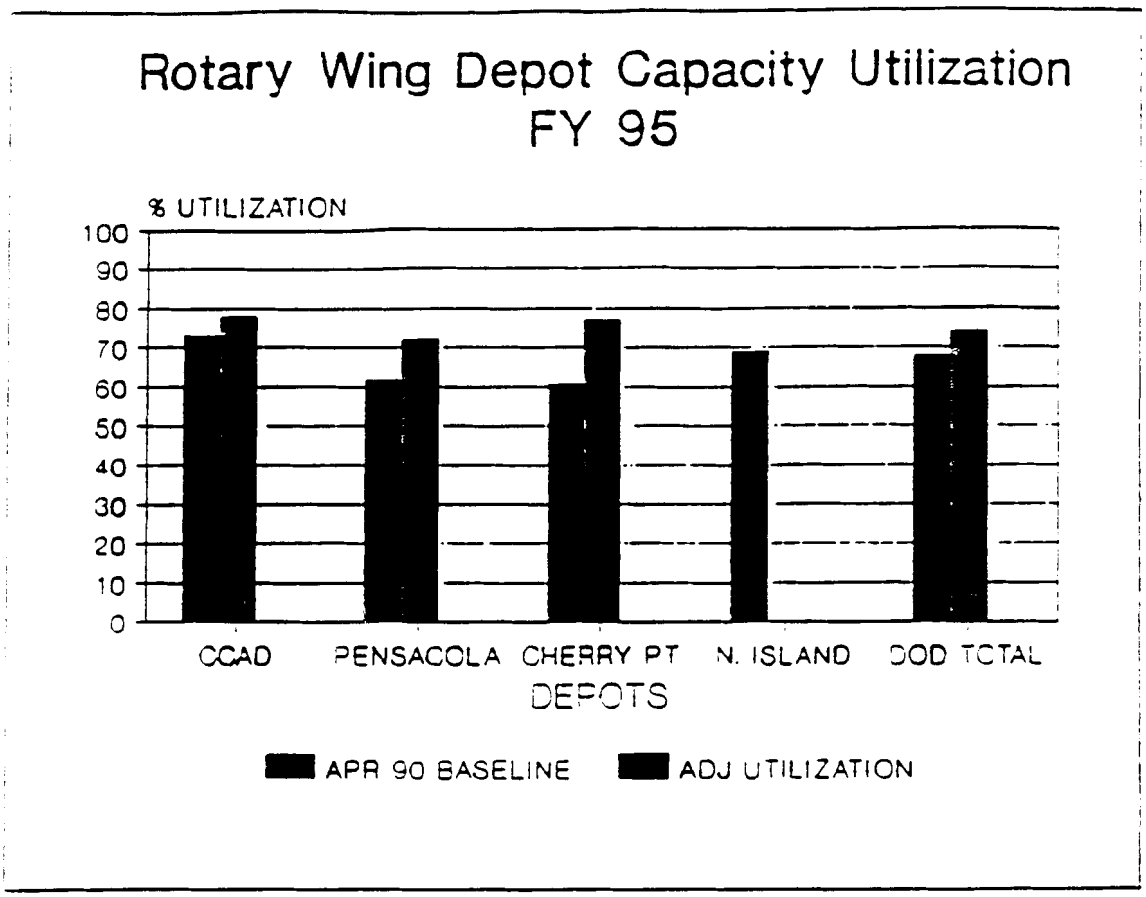

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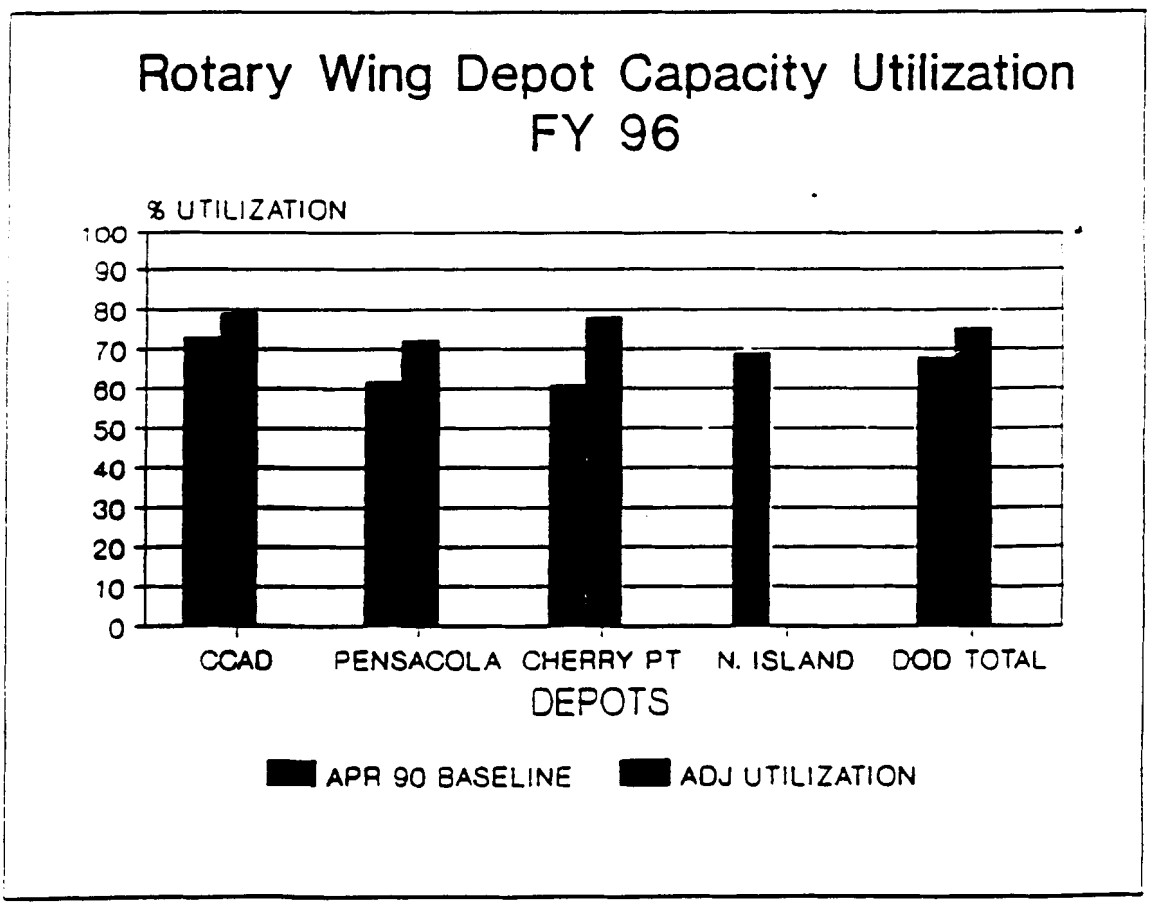

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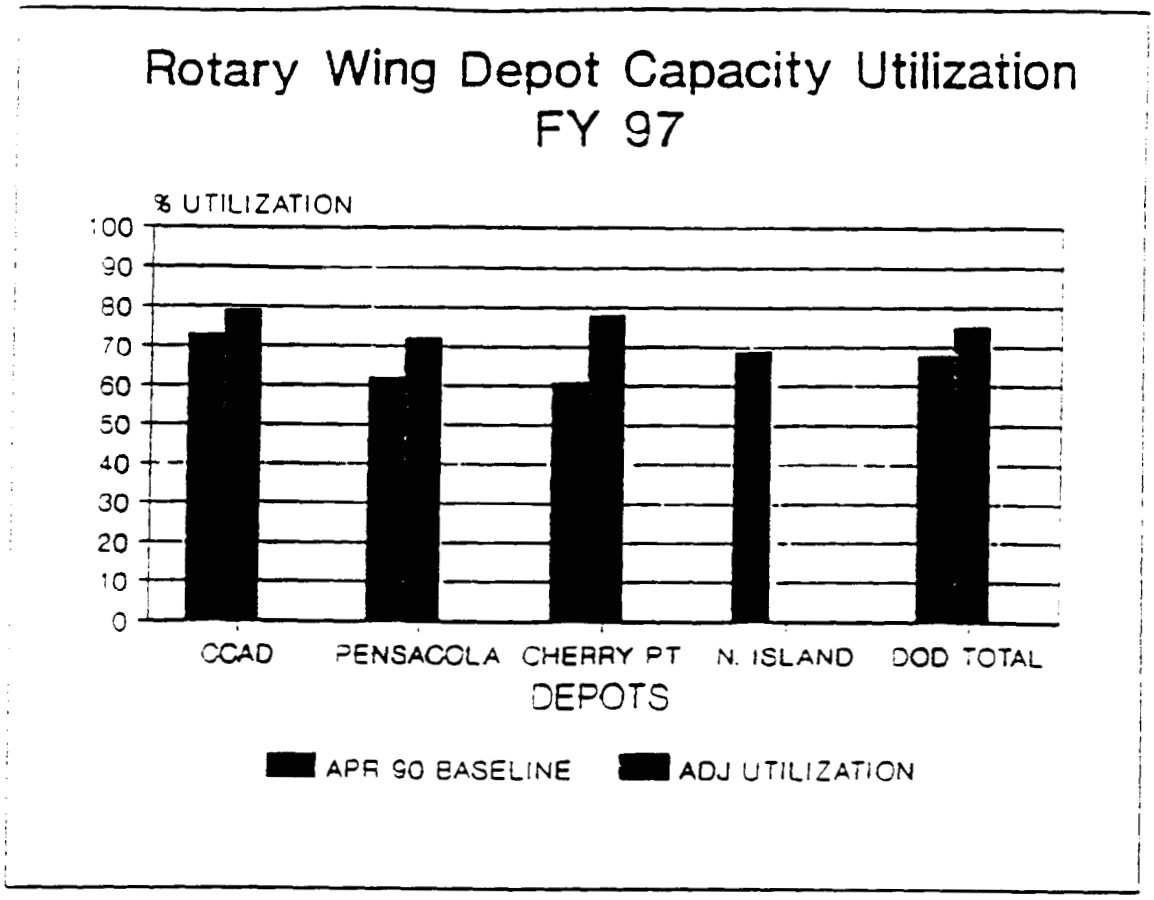
Rotary Wing Depot Capacity Utilization
FY 97
% UTILIZATION
100
90
80
70
60
50
40
30
20
10
0
CCAD
PENSACOLA
CHERRY PT
N. ISLAND
DOD TOTAL
DEPOTS
APR 90 BASELINE
ADJ UTILIZATION

DRAFT

SOR DECISION ACTION

A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K) 000's	G ANNUAL BUSINESS BASE ($M) 000's	H CONS, BS OR PWPC DECISION (CONS - FY) (BS - FY) (PWPC - FY)	I PROJECTED COSTS & SAVINGS ($M)						
								SERVICE	B1	S2	B3	B4	B5	TOTAL
								COST OF ACTION:		3.442				
T-58/T-64 ENGINES	N(N)	C	339	CP(C) NI(P)	156.7	2,893.7		N		2.2	.980	.245	1.23	1.475
NEW TOTAL							1/S 92	TOTAL		2.2	.980	.245	1.23	1.475

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SOR DECISION ACTION

A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K) 000's	G ANNUAL BUSINESS BASE (CBB) 000's	H CONB, DS OR PYPC DECISION (CONS - FY) (DS - 1 Y) (PYPC - 1 Y)	I PROJECTED COSTS & SAVINGS ($M)						
								SERVICE	91	92	93	94	95	TOTAL
								COST OF ACTION: N/A						
TRANSITION/ LIMITED COMPETITION	A(L) N F	C	A	CS (C) CN (P)	2,080	181,502		A	5.7	13.5	6.2	8.1	9.9	42.8
NEW TOTAL							P/PC	TOTAL						42.8

* NOTE: AH-64A - 84 components, varying quantities
UH-60A - 210 components, varying quantities
CH-47D - 18 components, varying quantities

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SOR DECISION ACTION

A ITEM	B SERVICE USER LEAD (L)	C NON-CORE (NC) CORE (C) ABOVE CORE (AC)	D UNITS PER YEAR	E SOR	F ANNUAL WORKLOAD (DLH-K) 000's	G ANNUAL BUSINESS BASE (SBB) 000's	H CONS, DS OR PPC DECISION (CONS - FY) (DS - FY) (PPC - FY)	I PROJECTED COSTS & SAVINGS ($M)						
								SERVICE	91	92	93	94	95	TOTAL
								COST OF ACTION: .212						
H-46 AIRFRAME *	N(N)	C	201	CP(C) NI(P)	248.0	4,585.0		N	656	856	856	856	856	4,068
NEW TOTAL							1/5 91	TOTAL						4,068

*Excludes Components

DRAFT

DEFENSE DEPOT MAINTENANCE COUNCIL
(DDMC)

JOINT SERVICE BUSINESS PLAN

FEBRUARY 1991

DEPARTMENT OF THE ARMY
DEPARTMENT OF THE NAVY
DEPARTMENT OF THE AIR FORCE
Washington, D.C.

JOINT MEMORANDUM FOR THE ASSISTANT SECRETARY OF DEFENSE
(PRODUCTION AND LOGISTICS)

Subject: Joint Service Business Plan

The Deputy Secretary of Defense, in his June 30, 1990 memorandum entitled "Strengthening Depot Maintenance Activities," directed the Services to develop and implement individual near-term plans and a joint long-range plan to identify increased efficiencies and cost reductions for DOD depot maintenance operations for the period FY91-FY95. The near-term plans were to identify savings totaling $1.7 billion, while the joint plan was to identify savings totaling $2.2 billion. The individual Service near-term plans, which were all submitted by July 30, 1990, specified internal Service actions to achieve cost savings. The strategy for achieving the long-range savings was set forth in our "Joint Service Long-Range Plan for Increased Efficiencies" dated September 28, 1990. The long-range savings were subsequently identified in DMRD 903. To aid in identifying long-range savings, the Defense Depot Maintenance Council (DDMC), at its July 24, 1990 meeting, commissioned 21 joint Service commodity studies to develop future depot maintenance strategies for assigned commodities. The ASD(P&L) memorandum of September 20, 1990 directed that these studies be completed by January 31, 1991. The commodity studies have been completed. We have reviewed the studies and developed the Joint Service Business Plan which is forwarded herein. The Plan summarizes each of the commodity studies, sets forth our decisions and identifies projected savings to be applied toward the long-range goals of DMRD 903.

We are directing approximately 80 cost saving actions which involve conducting public-private competitions for specific workloads and shifting other workloads to increase interservicing and consolidation. The projected FY91-FY95 savings of these actions is $1.1 billion and represents a portion of the $2.2 billion long-range goal of DMRD 903. The balance of the savings are being identified in the individual Service business plans. All of the initiatives identified herein and in the Service plans will be brought together in the DDMC Corporate Business Plan due May 1, 1991.

We appreciate your continued support in this important matter.

OGEN W. SHANNON Under Secretary of the Army	J. DANIEL HOWARD Under Secretary of the Navy	ANNE N. FOREMAN Under Secretary of the Air Force

DATE: FEB 28 1991

9. 02

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SECTION I

FOREWORD

This Joint Service Business Plan (JSBP) identifies specific actions which the Services are taking to implement recommendations from the commodity groups chartered by the Defense Depot Maintenance Council (DDMC). This JSBP is a compilation of Service contributions directed toward attaining the $2.2 billion long-range savings target set forth in the Service Under Secretaries approved "Joint Service Long-Range Plan (JSLRP) for Increased Efficiencies." Other savings essential to achieving the balance of the long-range goal are being addressed in continuing efforts by the joint Service depot maintenance community. Strategies developed by the commodity study groups form the foundation of this report. Opportunities for consolidation, interservicing, and competition of workloads have been identified which will enable the depot maintenance community to continue meeting the fiscal challenges of the Defense Management Report while providing optimum support to our operating forces during both peacetime and wartime. The "DDMC Corporate Business Plan" will roll up both short- and long-term Service business plans and the JSBP efforts to achieve the $3.9 billion savings and will be provided on May 1, 1991.

SECTION II

EXECUTIVE SUMMARY

In July 1990, the Defence Depot Maintenance Council (DDMC) commissioned 21 joint Service studies to develop future maintenance strategies for assigned commodities. These commodities cover about 45 percent of the total depot workload. The studies identified specific actions which will result in depot savings that are called for in the long-range goals identified in Defense Management Report Decision (DMRD) 908. This plan is a compilation of the Service approved actions resulting from the studies. It identifies related savings and establishes policy and procedures to be utilized to execute interservice decisions which are within the scope of the studies. This plan identifies savings of $1.1 billion and represents a portion of the $2.2 billion long-range goal of DMRD 908. The remainder of the savings are being identified in the individual Service business plans. All of the initiatives identified herein and in the Service plans will be brought together in the DDMC Corporate Business Plan due May 1, 1991.

Over 80 specific actions have been identified which will result in FY91-FY95 savings. The actions are categorized as either interservice, competition or consolidation. The cumulative totals of the savings ($M) to be applied to the DMRD 908 long-range goal are:

	Inter-Service	Compe-tition	Consol-idation	Total
Army	6.2	54.2	290.9	351.2
Air Force	42.7	186.7	2.6	232.0
Navy	50.9	437.7	29.0	517.6
Marine Corps	1.0	3.4	0.0	4.4
Total	100.7	682.0	322.5	1105.2

Due to rounding, not all figures add exactly.

Interservice: Workloads of 2.1 million direct labor hours will be interserviced with a projected savings of $101 million. These actions will increase interservicing by two percent of the total DOD depot maintenance workload. Assuming that another Service wins some portion of the identified competitions, the percentage of interservicing workload will be increased even further.

Competition: Workloads totaling 9.1 million direct labor hours will undergo public-private or public-public competition. The expected FY91-FY95 savings total $682 million. The competition candidates in this plan are a result of the commodity studies and do not include all potential candidates including those identified as DDMC competition prototypes.

Consolidation: To improve capacity utilization, 4.7 million direct labor hours of organic workload are being consolidated. In addition, 2.8 million direct labor hours of current contract workload will be consolidated into organic depots. Associated savings are $322 million. There are additional savings to be achieved through divestiture of excess capacity resulting from an increase in interservicing and workload consolidations. They will be identified by the Services in their respective business plans.

SECTION III

INTRODUCTION

The Deputy Secretary of Defense, in his June 30, 1990 memorandum entitled "Strengthening Depot Maintenance Activities," directed the Service Secretaries to develop and implement individual near-term plans and a joint long-range plan to identify increased efficiencies and FY91-FY95 cost reductions for DOD depot maintenance operations. The near-term plans were to identify savings totaling $1.7 billion, while the joint plan was to identify savings totaling $2.2 billion. The individual Service near-term plans, which were all submitted by July 30, 1990, specified internal Service actions to achieve the required cost savings. To provide a common basis for future depot maintenance assessments and analyses, the DDMC initiated four generic studies on topics of general application. Additionally, to aid in identifying long-range savings, the DDMC commissioned 21 joint Service commodity studies to develop future depot maintenance strategies for assigned commodities. The number of studies was reduced to 18 by consolidation of aircraft and engine studies.

The overall strategy for achieving the long-range savings was set forth in the "Joint Service Long-Range Plan (JSLRP) for Increased Efficiencies" which was approved by the three Service Under Secretaries on September 28, 1990. The Under Secretaries apportioned the $2.2 billion long-range savings to the individual Services and specified that savings will be achieved through increased competition for depot maintenance workloads, increased interservicing of depot maintenance workloads, and achievement of cost effective utilization of organic depot maintenance capacity. The JSLRP stated that a joint Service plan would be developed and published annually to provide a strategy for, and track progress toward, achieving cost savings. That initial effort, which will be titled the "DDMC Corporate Business Plan," is due on May 1, 1991.

The objectives of this document are to: (1) summarize the results of the generic and commodity studies, (2) establish an integrated joint Service depot maintenance plan for the commodities studied, and (3) document savings that will be realized by implementing the joint Service actions set forth in this plan. Additionally, Service actions being taken as a result of the commodity studies are detailed herein. Savings associated with the specific actions represent a portion of the $2.2 billion long-range goal and will be rolled up, along with other Service initiatives, into the DDMC Corporate Business Plan. Continuing joint Service efforts to identify savings essential to achieving the balance of the long-range savings goal will also be addressed.

The scope of the commodity studies involved approximately 45 percent of the total depot workloads and identified over $1.1 billion in potential savings. Excluding ships, about 20 percent of the total workload remains, which once evaluated, has the potential for generating additional savings. In an effort to capture some of these savings, the Joint Policy Coordinating Group on Depot Maintenance (JPCG-DM) is reviewing other commodities for possible areas of study. Potential candidates include aircraft and armored vehicle small gas turbine engines (auxiliary power units), avionics, and shipboard electronics. In addition, some of the studies recommended assignment of single repair design activities (technology development center for repair process) for specified commodity groupings. The JPCG-DM will evaluate these possibilities and make assignments as necessary.

The commodity studies identified significant savings attributable to improved capacity utilization. Divestiture or mothballing of unneeded excess capacity is a strategy of each Service. Therefore, as the Services develop their sizing plans relative to their total workloads, additional capacity utilization savings related to the studies are expected. Specific actions and projected savings will be reflected in the individual Service plans and summarized in the DDMC Corporate Business Plan.

Service competition, interservicing and consolidation cost savings plans are based on the premise that retrograde will continue to return for depot maintenance as currently scheduled. If the product fails to be returned for scheduled depot maintenance, the business base on which the savings is predicated erodes. As Operation Desert Storm continues, the Services are beginning to see postponements of scheduled maintenance, and disruption of normal pipeline retrograde for non-scheduled maintenance. These unpredictable fluctuations in depot maintenance workload generating from extended deployments are real factors which must be considered when developing any joint Service business plan for depot maintenance. To ensure the DDMC Corporate Business Plan is realistic and executable, it must be a dynamic document that allows for necessary changes so the Services can meet their savings goals while maintaining optimum support to operating forces during peacetime and wartime.

Within the scope of the commodity studies, the policy and procedures presented in Appendix I will be used to execute the interservice decisions being presented herein. These procedures are consistent with existing regulations and will serve to ensure that the gaining Service can deliver a product with acceptable cost, quality and schedule. Source of repair assignments for future weapon systems will continue to be determined in accordance with the new start procedures established by the Logistics Depot Maintenance Interservice Program (OPNAVINST 4790.14/AMC-R 750-10/AFLCR 800-30/AFSCR 800-30/MCO P4790.10A).

All savings reflected in this plan are in "Then Year" dollars.

SECTION IV

DDMC STUDIES

A primary mission of the DDMC, as stated in DODD 5128.32, "Defense Depot Maintenance Council," is to advise the ASD (P&L) on initiatives for reducing the costs and improving the efficiency and effectiveness of worldwide depot maintenance management operations. The DDMC commissioned numerous joint Service studies on July 24, 1990 to provide a common basis for future depot maintenance assessments and analyses and to develop future depot maintenance strategies for specific commodities. A lead Service was assigned for each study.

A. Generic Studies

Four generic studies were commissioned by the DDMC:

- Capacity/Utilization: Determine ways to comparably measure depot maintenance capacity and utilization (JPCG-DM lead).

- Performance Measurement: Develop indicators for measuring specific aspects of depot maintenance performance (Navy lead).

- Maintenance Management Information Systems (MMIS): Determine ways to exchange depot maintenance information between the Services with the least number of unique maintenance systems (Army lead).

- Cost Comparability: Develop a means for comparing depot maintenance cost data among and between the Services and the private sector (Air Force lead).

1. Capacity/Utilization Study

The study team was tasked to develop recommendations for a capacity measurement process which portrays comparable organic depot maintenance capacity and provides a basis for determining utilization. The emphasis was on developing methods that will result in comparable data to be used in future workload consolidation studies. The study report was submitted to the Assistant Secretary of Defense (Production and Logistics) on December 5, 1990.

The study concluded that the basic approach to capacity measurement should be a refinement of the current methodology. It also concluded that since capacity data is a broad indicator of relative size rather than a precise measure, it should be referred to as an "index." The basic formulas for computing capacity indices were developed to support peacetime and mobilization planning. Specific refinements to the current capacity methodology were recommended to promote comparability, accommodate configuration changes, delete special consideration for bottlenecks, and include uncovered production areas.

Recommended formulas to measure utilization were developed, as were recommendations for use of utilization data and depot utilization goals. As with capacity, utilization data should be referred to as an index. Specific formulas were developed to reflect peacetime funded, peacetime executable, and mobilization requirements. Shipyard utilization should be based upon drydock use rather than the conventional work position count to recognize the unique nature of shipyard work.

Capacity and utilization indices are broad indicators rather than precise measures. They should not be the sole basis for workloading decisions. Workload consolidation determinations should be based on a detailed review of the specific workloads and facilities involved. To minimize the possibility of misinterpretation and misuse of capacity and utilization index data, the data should be reported primarily within the DOD performance measurement system currently under development.

The current DOD policy requiring 100 percent utilization in peacetime was reviewed. While capacity in excess of requirements needs to be divested, some reserve capacity must be retained to support sound business practices and military necessities such as mobilization. One hundred percent utilization is usually a costly approach. Rather than matching workload with capacity, facilities can operate at a more cost effective level by balancing flow with demand. It was recommended that the DOD utilization policy in DODD 4151.1 be revised to recognize the need for reserve capacity and require a level of peacetime utilization that will ensure that mobilization and contingency requirements can be met while operating in a cost effective manner.

The Services are collecting and analyzing capacity data under the proposed revision to DOD 4151.15H for subsequent reporting.

2. Performance Measurement System Study

The Performance Measurement Study Group was tasked to develop a set of command performance indicators for DOD industrial depots. The approach was to develop key indicators of performance, consistent with Total Quality Management principles, that would accommodate the DOD depot infrastructure. Rather than measuring performance based on single point indicators, as has been the practice, a system that uses trend analysis and emphasizes continuous improvement is being developed. The seven key indicators are effectiveness, efficiency, quality, productivity, innovation, capacity utilization and cost performance. The actual mechanisms and formulas for measuring the key areas of performance vary. Some key areas use several quantitative indicators, some use only one quantitative indicator, some use quantified indices, and one uses a qualitative narrative. Those areas of performance that require quantitative approaches will rely on data products from the depots and Services.

Phase one, development of the performance measurement indicators, is complete. Phase two, system development, selection of prototype depots, data collection and system validation, has begun. Under the direction of a lead Service, technical experts will develop a data based system that blends with the ongoing efforts of MMIS.

A focal point for the collection and maintenance of corporate level performance measurement data will be designated. Upon completion of phase two a fully integrated performance measurement system will be available for use throughout the DOD maintenance infrastructure.

3. Maintenance Management Information Systems Study

a. Summary:

The study group was tasked to maximize the exchange of information among organic DOD depots and minimize the number of unique maintenance information systems needed. The study's three major objectives are:

- Identify depot maintenance functions and the information systems that support those functions. The functions referred to are those performed at the depot maintenance facility and at higher headquarters. Information systems to be identified include those which are under development and are due to be fielded within two years.

- Develop a matrix of all Service depot maintenance management information systems. This will aid in identifying near and middle term opportunities for sharing information systems or modules needing little or no modification, and in selecting interim standard systems from among current or developing systems to be adopted by all services.

- Provide a long term plan to institutionalize data standardization and information exchange, using joint maintenance systems where feasible.

To date, task group members have defined common maintenance management functions at the depot level, and are documenting current and developing information systems which support those functions. Interim reports have provided information on which to base several decisions.

b. Joint Service decision:

(1) Complete the MMIS Study development of a plan for establishment of joint depot maintenance systems by April 29, 1991.

(2) Establish the Air Force as Executive Agent (E/A), reporting to the DDMC, to execute approved depot level MMIS plans.

(3) A goal of the E/A will be to create a separate depot maintenance corporate information management (CIM) system. The depot maintenance CIM should be under the DDMC using the E/A for depot MMIS.

4. Cost Comparability Study

The Cost Comparability Handbook was developed to facilitate cost comparability among public and private depots. The various services have devised different cost accounting systems to meet their individual needs. In order to consider possible workload consolidations and compete depot maintenance workloads, it was essential to provide standardized procedures and techniques to be able to compare the costs involved in performing the work. This handbook uses unit costs to perform comparisons. The handbook identifies recurring and nonrecurring costs to be included when comparing different sources of repair. The handbook "levels the playing field" between depots, public and private, and will be used when making cost comparisons between sources of

repair. There is a section of commonly agreed to definitions as applicable to this handbook.

B. Commodity Studies

The DDMC commodity studies were commissioned to develop depot maintenance strategies for assigned commodities. The study groups included representatives of each Service and, where applicable, DLA. Each study began with a comprehensive review of current and future depot maintenance workload requirements and capacities and capabilities of current sources of repair for those workloads. The study groups identified opportunities for achieving cost savings through increased competition for depot maintenance workloads, increased interservicing of workloads, and intraservice consolidation of workloads. Figure 4-1 depicts the individual commodity studies under their respective lead Services. Results of the studies are addressed in Section V.

Table 4-1

DDMC COMMODITY STUDIES

ARMY LEAD

- Rotary Wing Aircraft
- Combat Wheeled Vehicles
- Gas Turbine Engines/ Compressors
- Conventional Munitions
- Rail Equipment
- General Purpose Equipment

AIR FORCE LEAD

- TF30/F110/LM2500 Engines**
- Land Based Aircraft*
- Type I Metrology Laboratories
- Landing Gear
- Engine Blades/Vanes
- Bearings

NAVY LEAD

- Carrier Based Aircraft*
- Tactical Missiles
- F-4 and OV-10 Aircraft*
- Flexible Computer Integrated Manufacturing
- Remotely Piloted Vehicles/ Unmanned Aerial Vehicles
- J79/T56 Engines**

MARINE CORPS LEAD

- Small Arms
- Ground Communications/ Electronics Equipment

DLA LEAD

- Industrial Plant Equipment

*Combined into one Fixed Wing Aircraft Study
**Combined into one Engine Study

SECTION V

COMMODITY GROUP STUDIES AND JOINT SERVICE DECISIONS

A. Strategy.

1. The Deputy Secretary of Defense memorandum of June 30, 1990 entitled "Strengthening Depot Maintenance Activities" required the Services to submit long-range plans to reduce the cost of depot maintenance operations by $2.2 billion. In the Service Under Secretaries Joint Service Long-Range Plan of September 28, 1990, it was emphasized that the $2.2 billion savings will depend in part on the DDMC Commodity Study Group Study results. Savings projected in the plan were targets and required development of individual Service Business Plans to identify actual savings. The Joint Service Long-Range Plan provided a matrix of total savings targets.

2. The commodity studies have been completed. These studies were reviewed by the Services and their consolidated findings are reported herein. The integrated effort is a cohesive Joint Service Plan which portrays the joint Service maintenance strategy for the commodities under study by increasing competition, interservicing, and organic depot capacity utilization.

B. Commodity Studies.

In the following pages, each study is summarized as to its scope, approach and savings. Based on the findings and recommendations of the studies, the Services have jointly agreed to specific actions which are itemized after each study summary. All cost savings identified are in "Then Year" dollars for the period FY91-FY95.

1. Rotary Wing Aircraft Study (Army)

a. Summary:

This study includes rotary wing aircraft systems and equipment and associated gas turbine engines.

The Rotary Wing Study Group reviewed the total DOD helicopter depot maintenance workload against the total peacetime capacity at the existing four helicopter repair activities.

The review revealed that excess depot capacity existed at Corpus Christi Army Depot (CCAD), Naval Aviation Depot (NADEP) Pensacola, NADEP Cherry Point, and NADEP North Island and that DOD helicopter workload could be maintained at three depots instead of the current four. The study group then identified several methods to consolidate the workload to reduce excess capacity. The most beneficial alternatives were selected. A cost analysis was conducted on moving the T58 and T64 engine workload from NADEP North Island to CCAD or to NADEP Cherry Point. Another cost analysis was conducted on moving the H-46 helicopter airframe and components from NADEP North Island to NADEP Pensacola or NADEP Cherry Point. In both cases, the most cost effective alternative was to reassign the workloads to NADEP Cherry Point.

Consolidation of the NADEP North Island T58 and T64 engine workload and the H-46 helicopter airframe and component workload increased capacity utilization at NADEP Cherry Point. Increased capacity utilization at NADEP Pensacola and CCAD was achieved through concentration of the Services' core workload at these two depots. Significant improvement in utilization and reduced costs will result at CCAD through the transitioning of AH-64A, UH-60A, and CH-47D core workload components from current sole source contract. Additional savings via competition are expected to be generated when the Services' competition programs are fully implemented. Total rotary wing study savings identified were $53.197M.

b. Joint Service decision:

(1) Move T58 and T64 engine repair from NADEP North Island to NADEP Cherry Point. Cost savings = $1.885M (Navy action.)

(2) Move H-46 airframe and component repair from NADEP North Island to NADEP Cherry Point. Cost savings = $4.455M (Navy action.)

(3) Transition Army depot repair work (AH-64A, UH-60A, and CH-47D components) currently on contract to CCAD. Cost savings = $46.857M. Also, the Army will investigate competing those workloads above core (either public-public or public-private) to obtain the best value. (Army action.)

2. Combat, Artillery, and Tactical (CAT) Vehicles Study (Army)

a. Summary:

This study includes heavy combat vehicles (tanks, tank chassis based vehicles and assault vehicles, and includes on-board equipment directly related to the mission of the vehicle such as main guns and fire control systems), light combat vehicles (armored personnel carriers, assault vehicles, and air defense weapons), artillery (towed or self-propelled), and wheeled vehicles and trailers (excluding non-tactical or administrative use vehicles).

The CAT study group identified and reviewed the DOD depot maintenance workload for these various systems against the existing peacetime capacity at the depots supporting these systems. The workload review revealed that excess capacity existed at Anniston Army Depot (ANAD), Letterkenny Army Depot (LEAD), Red River Army Depot (RRAD), and Tooele Army Depot (TEAD) and that Marine Corps Logistics Bases (MCLB) Albany and Barstow were at maximum peacetime capacity. To achieve increased capacity utilization, realignments of workload were identified.

A cost analysis was conducted on the transfer of the artillery workload from LEAD to RRAD, the consolidation of all Army tactical vehicles at TEAD, and the consolidation of the Mainz Army Depot (MZAD) workload at ANAD, RRAD, and TEAD. These consolidations obtained a substantial increase in capacity utilization as well as the most cost savings. Additionally, tactical vehicle secondary items above core were identified for public-private competition. Total savings identified in this study were $189.054M.

b. Joint Service decision:

(1) Lay away excess depot capacity at ANAD, RRAD, and TEAD. Cost savings = $10.378M. (Army action.)

(2) Consolidate self-propelled artillery depot repair by moving the self-propelled artillery workload from LEAD to RRAD. Cost savings = $14.676M. (Army action.)

(3) Distribute the MZAD CAT vehicle workload to CONUS depots (RRAD, ANAD, and TEAD). Cost Savings = $98M. (Army action.)

(4) Consolidate depot repair of Army tactical vehicles at TEAD in the planned Consolidated Maintenance Facility (CMF). Cost savings = $45.700M. (Army action.)

(5) Abolish restrictions on competition (OSD action) and compete above core tactical vehicle secondary items. Cost savings = $20.3M. (Army action.)

3. Gas Turbine Engines (GTE) and Compressors Study (Army)

a. Summary:

This study includes GTEs which are components of GTE powered ground support equipment. Airborne GTEs were excluded. Compressors which were included are stand-alone end item air producing compressors. Compressors that are components of end items were excluded.

The study group identified the GTE workload and the facilities providing depot level maintenance. Since the scope of study was limited to ground support equipment, total consolidation of workload could be achieved by transferring current workload at TEAD to San Antonio Air Logistics Center (SA-ALC). However, a future review of all small GTEs (auxiliary power unit on aircraft, etc.) is warranted.

The compressor workload is small with most of the workload presently being accomplished at TEAD. The Air Force currently has some compressor workload on contract that will be reviewed prior to contract expiration in FY95 to determine if it is cost effective to transfer to TEAD.

Total savings identified in this study were $394K.

b. Joint Service decision:

(1) Consolidate ground support GTE workload from TEAD to SA-ALC. Cost savings = $394K. (Air Force/Army action.)

(2) Review Air Force compressor workload prior to contract termination in FY95 to determine cost effectiveness of transfer to TEAD. (Air Force action.)

4. Conventional Munitions Study (Army)

a. Summary:

This study includes ammunition, bombs, grenades, rockets, rocket ammunition, rocket components, land mines, military chemical agents, pyrotechnics, demolition material, bulk explosives, fuzes, and primers. Conventional munitions not under the cognizance of the Single Manager for Conventional Ammunition (SMCA) were not included.

The study group reviewed depot level workload for conventional munitions and associated facilities. Intermediate workload and facilities were also reviewed. The Army is the Single Manager for Conventional Ammunition, and the workload has already been consolidated for most efficient and effective operations. The possibility of consolidating Navy intermediate level maintenance at the Army facilities was examined, but was not a cost effective alternative and would impede readiness. The study review revealed that the SMCA is already achieving the goals and objectives of the DMRD and that there were no further cost effective consolidations identified at this time. There were no additional savings identified in this study.

b. Joint Service decision:

Retain the existing SMCA. For conventional munitions, the SMCA essentially has achieved the goals and objectives of the DMRD. (No action.)

5. Rail Equipment Study (Army)

a. Summary:

This study includes the captive fleet of locomotives and rolling stock of the Army and the Air Force. It excludes locomotive cranes, cabooses, and guard cars (they will be leaving the active inventory). It also excludes assets of the Defense Freight Railway Interchange Fleet which are repaired under other practices. No assets of the Navy, Marine Corps, or DLA were included since there are no plans to modernize any of their locomotives during the period covered by the study.

The study team reviewed both the intermediate and depot level workload for DOD rail. The Army has the only DOD rail facility that performs depot level repair of DOD railroad equipment. It is located at the TEAD Rail Facility. Intermediate maintenance is also a function of the Army and is currently being performed by the US Army Troop Support Command (TROSCOM) which operates three mobile rail repair shops (MRRS).

Interservicing is already being accomplished wherever possible and the study group concentrated on consolidation of rail workload and functions. One study conclusion was that it would be more cost effective to consolidate the intermediate rail workload at TEAD. Another is that there is a potential for substantial savings through public-private competition of the Peacekeeper Rail Garrison (PRG) program if it goes into full production.

Total savings identified by this study were $769K.

b. Joint Service decision:

(1) Consolidate the mobile rail repair shops at New Cumberland Army Depot (NCAD), RRAD, and TEAD to TEAD. Cost savings = $769K. (Army action.)

(2) Investigate remanufacture of locomotives required for the PRG at TEAD if it is approved for full scale production and deployment. (Air Force action.)

6. General Purpose Equipment Study (Army)

a. Summary:

This study includes general purpose ground support equipment. Categories of equipment are Army and Marine Corps construction/material handling equipment, bridging, air conditioning, water/POL equipment, and shop sets as well as Army, Marine Corps, Air Force, and Navy generators.

The study team examined existing DOD depot maintenance capabilities for general purpose equipment. Review of these capabilities revealed that the Navy and Air Force do not require or perform depot level maintenance on general purpose or construction equipment, but they do have capability for power generation items. All Army general purpose and construction equipment is consolidated at TEAD, while the Marine Corps performs maintenance at MCLB Albany and Barstow. The Marine Corps currently interservices their small generators to the Army at TEAD. Marine Corps and Navy 100KW and 200KW generators are currently interserviced with the Air Force at SM-ALC.

This commodity workload is of relatively low density, work is not highly technical, no special facilities are required, and the skill base to accomplish the work can be utilized from a mix that supports other major workloads. As a result, the study group identified only minor workload that should be reassigned. Bridge Loader Transporter structural bridging can be more effectively repaired at MCLB Barstow instead of TEAD due to the outside nature of the work. The 100KW and 200KW generator workload at SM-ALC is a candidate for public-private competition.

Total study savings identified were $222K.

b. Joint Service decision:

(1) Transfer the Bridge Loader Transporter structural bridging workload from TEAD to MCLB Barstow. Cost savings = $222K. (Army/Marine Corps action.)

(2) Compete (public-private) the 100KW and 200KW generator workload at SM-ALC. (Air Force action.)

7. Tactical Missile Study (Navy)

a. Summary:

This study analyzed all surface launched, ground launched, and air launched tactical missiles as well as associated Army and Marine Corps missile support equipment (launchers, radars, fire control, etc.). Excluded from the study were large missiles such as TOMAHAWK, ICBM, and submarine-launched ballistic missiles, as well as Navy and Air Force missile support equipment.

The study baseline was the FY91 President's Budget. The team analyzed workload currently performed at ten organic depots, several commercial activities, as well as intermediate level maintenance currently performed at depot activities. The following assumptions were made throughout the study: (1) all private and organic workload will be available for competition, (2) DOD maintenance funding profiles will be relatively flat in the out years, (3) funding will be available to cover costs of recommended consolidations, (4) direct to indirect ratios will be increased at gaining activities, (5) personnel numbers will fluctuate as a function of workload, (6) skilled personnel will be available, and (7) facilities will be available at consolidation sites without major construction.

The study team recommended consolidation of tactical missile depot level maintenance from Sacramento Army Depot (SAAD), ANAD, RRAD, Tobyhanna Army Depot (TOAD), Ogden Air Logistics Center (OO-ALC), NADEPs Alameda and Norfolk, Naval Weapons Stations (NWS) Seal Beach, Concord, and Yorktown, and commercial contract to LEAD. Marine Corps HAWK support equipment workload will remain at MCLB Barstow, and energetic material workload will remain at Naval Ordnance Station (NOS) Indian Head. The team agreed to consolidate intermediate maintenance at NWS Seal Beach, NWS Yorktown, and NWS Charleston. This consolidation also incurs savings by eliminating two MILCON projects. The Army HAWK and PATRIOT intermediate level (Theater Readiness Monitoring Facility) will remain at RRAD.

Total savings identified in this study were $128.7M.

b. Joint Service decision:

(1) Consolidate tactical missile depot level maintenance for guidance and control sections and Army ground support equipment from SAAD, ANAD, RRAD, TOAD, OO-ALC, NADEPs Alameda and Norfolk, NWSs Seal Beach, Concord, and Yorktown, and commercial contract to LEAD. Cost savings = $102.997M. (Additional cost savings accounted for under associated deleted MILCON projects.) (All Services' action.)

(2) Consolidate Navy tactical missile intermediate level maintenance at NWS Seal Beach (surface and air - West Coast), NWS Yorktown (surface and air - East Coast), and NWS Charleston (surface - East Coast). Cost savings = $1.357M. (Additional cost savings accounted for under associated deleted MILCON projects.) (Navy action.)

(3) Terminate the following MILCON projects. Cost savings for terminated MILCONs is $24.34M. (Navy and Army action.)

(a) Intermediate level projects: NWS Concord: P-271, P-282, P-289.

(b) Depot level projects: ANAD: P-31515, P-32320; and NWS Concord: P-310.

(4) Reassign the Army Tactical Missile System (ATACMS) depot level maintenance and stockpile reliability program efforts from ANAD to LEAD using existing facilities, except for gyro workload which is assigned to the Air Force Aerospace Guidance and Metrology Center (AGMC). (Cost savings accounted for under deleted MILCON projects P-31515 and P-32320). (Army/Air Force action.)

8. Flexible Computer Integrated Manufacturing (FCIM) Study (Navy)

a. Summary:

The study includes an analysis of FCIM initiatives and makes recommendations for the implementation of those initiatives which will reduce operational costs in the organic depots. FCIM is the integration of information and manufacturing technologies necessary to accomplish the manufacture and repair functions within the depot system. The FCIM environment includes: integrated product development, flexible manufacturing, globally linked and integrated data bases, inventory management systems, and paperless logistics support. The Military Services, DLA and the National Institute of Standards and Technology are presently pursuing FCIM initiatives.

The objectives of this study were to establish an ongoing planning process to coordinate Service efforts; maximize efficiency and effectiveness in FCIM implementation among the Services by avoiding unnecessary, costly duplication of efforts in development projects; and facilitate FCIM implementation to improve productivity and reduce operational expenses at Defense depot activities.

The study team conducted a cost benefit analysis for FCIM comparing operational costs and unit part/assembly costs before and after the implementation of FCIM technology in a typical depot. An investment analysis was made which included an assessment of the initial investment outlay required for plant equipment, computer hardware/software, integration and checkout, training, and annual operating costs. Cost/benefit and investment analyses were used to develop a strategy for implementing FCIM within the organic depots through FY95.

Although FCIM is a technology and not a commodity and does not fit with the other commodity oriented studies, the Services will continue to jointly pursue FCIM as a viable means for future savings. A joint Service coordinating group should be chartered for depot implementation of FCIM technology. Also, a DOD chartered strategic planning group should be established to develop a global plan for implementing FCIM within the private sector and DOD. No savings are attributable to the Services industrial fund budget at this time.

b. Joint Service decision:

(1) Charter a coordinating group for depot implementation of FCIM technology. (JPCG-DM action.)

(2) Establish a DOD chartered strategic planning group to develop a global plan for implementing flexible manufacturing within the private sector and DOD. (OSD is already establishing this group.)

9. Remotely Piloted Vehicles (RPV)/Unmanned Aerial Vehicles (UAV) Study (Navy)

a. Summary:

This study includes RPV/UAV and subscale drones/aerial targets. The study limited the RPV/UAV review to those that are fielded (i.e., PIONEER) or in full scale engineering development (i.e., the Unmanned Aerial Vehicle-Short Range (UAV-SR) and Medium Range (UAV-MR)).

The Military Services are acquiring pilotless aircraft systems that include air vehicles, launch and recovery equipment, and a station for controlling the RPV/UAV flight and processing of information received from the RPV/UAV. Numerous RPV/UAV programs are currently underway or in the planning stages under the direction of the UAV Joint Project Office.

The RPV/UAV depot maintenance study considered those systems that are currently in full scale engineering development (FSED) or production, and those currently fielded. Since there is only one system fielded (PIONEER) and two systems in development (UAV-SR and UAV-MR), there is very little historical or current workload data available to assess cost savings and management efficiencies. Significant cost avoidances can be realized, however, by developing a cohesive joint depot maintenance strategy for RPV/UAVs that will identify all opportunities for maintenance consolidation, thus ensuring the Services have responsive, cost effective depot maintenance for the RPV/UAV program.

The study team recommended retention of the commercial contract for PIONEER depot maintenance throughout the remaining service life of the system. PIONEER phaseout is scheduled to begin in FY95 as it is replaced by the UAV-SR. The team also recommended establishment of a single integrated organic depot for all RPV/UAVs. The Depot Maintenance Interservicing (DMI) new start process will be used to select a candidate RPV/UAV depot as technical specifications become available. This consolidation minimizes costs by precluding duplicate maintenance capabilities.

The study group review of subscale drones/targets determined that a modification to the current depot support arrangement or a transition to organic depot maintenance for subscale drones would not be cost effective. The current support arrangement strikes an economic balance between competitive commercial and organic support. However, designation of a single manager for subscale drones/targets warrants examination.

Total savings attributable to the RPV/UAV study is $600K and will occur in FY95, the first year a fielded system will undergo organic depot maintenance.

b. Joint Service decision:

(1) Retain Navy contract for PIONEER depot maintenance through the projected service life of the system (except for any proposed service life extension). (No current action.)

(2) Conduct a DMI review to identify a single depot for all UAVs to minimize cost and preclude duplicative maintenance capabilities for UAV unique subsystems/components. A specific depot assignment is not proposed at this time since data necessary to support a DMI new start study is not yet available for the systems

currently under development. A study will be conducted when data is mature. Cost savings (UAV-SR) = $600K. (UAV JPO action to submit for DML)

(3) Sustain the current depot support arrangement for subscale drones/targets. (No action.)

(4) JLC investigate the feasibility of designating a single Service manager for subscale drones/targets as a means to enhance planning for depot maintenance requirements. (JLC action.)

10. Engine Study (Air Force and Navy)

a. Summary:

This study includes the TF30, F110, J79, T56/501K17, and LM2500/TF39 gas turbine engines, modules, and components and accessories unique to those engines. With the exception of the LM2500 and TF39 (which have commonality), these engines have dual Service applications.

The study team conducted analyses on Navy and Air Force peacetime workload for FY88-FY95 to identify opportunities for consolidating, interservicing and competition. Actual performance based data was used for FY88-FY90, while the FYDP was used for FY91-FY95. The team looked at two Air Force depots (Oklahoma Air Logistics Center (OC-ALC) and SA-ALC) and five Navy depots (NADEPs Norfolk, Cherry Point, Jacksonville, Alameda, and North Island). Standardized procedures and techniques provided by the Cost Comparability Handbook were used to compare depot maintenance costs between activities for similar workloads.

The recommendations resulting from this study were as follows: The TF30 and F110 workload will be single sited at OC-ALC. The J79 engine will be single sited at NADEP Cherry Point. The LM2500 and the TF39 will be consolidated at one Naval Aviation Depot. The T56 will be jointly offered for competition by the Air Force and the Navy beginning in FY93.

Total cost savings resulting from this study is projected to be $50.1M.

b. Joint Service decision:

(1) Consolidate TF30 workload currently at OC-ALC and NADEP Norfolk to OC-ALC. Cost savings = $20.5M. (Navy/Air Force action.)

(2) Consolidate F110 workload currently at OC-ALC and NADEP Norfolk to OC-ALC. Coast savings is TBD. (Navy/Air Force action.)

(3) Consolidate J79 workload currently at OC-ALC and NADEP Cherry Point to NADEP Cherry Point. Cost savings = $8.4M. (Navy/Air Force action.)

(4) Determine joint Service core workload for the T56 workload currently at SA-ALC and NADEPs Norfolk and Alameda. Conduct a public-public competition to determine a single joint Service organic depot beginning in FY93. Conduct a public-private competition for joint Service above core workload. Cost savings = $7.82M for Navy. Cost savings for Air Force is TBD. (Navy/Air Force action.)

(5) Consolidate LM2500 and TF39 workload currently at SA-ALC and NADEP North Island to a NADEP to be determined. Cost savings = $13.4M. (Navy/Air Force action.)

11. Fixed Wing Aircraft Study (Air Force and Navy)

a. Summary:

This study includes all major fixed wing airframes operated by the Services. It also includes F-4 full scale drones.

The study team reviewed existing and future airframe repair capability and workload. The approach was to achieve significant cost savings through consideration of realistic consolidation and competition alternatives. Consideration was given to core workloads by weapon system and Service. The resulting decisions accounted for a total cost savings of $610.516M. Specific recommendations include:

(1) Public-private competition of selected above core airframe workloads.

(2) Consolidation of C-130 and F-4 airframe workloads.

(3) Public-private competition of F-4 drone conversion program.

b. Joint Service decision:

(1) Implement the NAVAIR Business Plan. (Navy action.)
A summary follows:

Aircraft	Current SOR	Decision	Cost Savings ($M)
S-3	NADEP Alameda	P/PC FY93	$9.4
A-6	NADEP Alameda	P/PC FY93	7.4
A-6	NADEP Norfolk	P/PC FY93	6.5
F-14	NADEP Norfolk	P/PC FY91	144.8*
A-4	NADEP Cherry Point	P/PC FY92	7.6
T-2	NADEP Jacksonville	P/PC FY94	12.5
P-3	NADEP Jacksonville	P/PC FY92	17.4
F/A-18	NADEP North Island	P/PC FY92	14.8
F/A-18	NADEP Jacksonville	P/PC FY92	0.8
E-2/C-2	NADEP North Island	P/PC FY93	3.0
F-14A/D	NADEP Norfolk	P/PC FY91	157.0*
A-6 Rewing	NADEP Norfolk/ Alameda	P/PC FY91/92	45.5*
		Total	$426.7

*Previously credited by OSD decision.

(2) Conduct public-private competition for selected Air Force aircraft workload. (Air Force action.) A summary follows:

Aircraft	Current SOR	Decision		Cost Savings (M)
E-3	OC-ALC	P/PC FY93		$2.286
B-1	OC-ALC	P/PC FY93		11.450
C-130	OO-ALC	P/PC FY93		9.153
F-16	OO-ALC	P/PC FY93		32.672
B-52H	SA-ALC	P/PC FY93		13.521
C-135	SM-ALC	P/PC FY93		25.134
F-15	SM-ALC	P/PC FY93		16.510
A-10	SM-ALC	P/PC FY94		1.647
F-111	SM-ALC	P/PC FY93		10.509
F-15	WR-ALC	P/PC FY94		24.481
C-141	WR-ALC	P/PC FY93		13.480
			Total	$160.843

NOTE: The above aircraft competition candidates may be adjusted upon development of the Air Force Business Plan.

(3) Jointly compete the Navy/Air Force F-4 Drone Conversion Program beginning in FY95. Cost savings = $14.4M. (Navy/Air Force action.)

(4) Make the following consolidations. (Navy/Air Force action.)

(a) Navy C-130s to the Air Force at OO-ALC. Cost savings = $3.183M.

(b) Air Force F-4s to the Navy at NADEP Cherry Point. Cost savings = $5.39M.

12. Type I Metrology Study (Air Force)

a. Summary:

This study includes consolidation alternatives for the Services' Type I metrology laboratories which provide Primary Standards traceable to the National Institute of Standards and Technology. The Type I metrology laboratories provide both "hands-on" calibration and related measurement and engineering support functions. This study includes only the calibration function. The Army laboratory is at Redstone Arsenal, the Navy laboratories are at NADEP North Island with a detachment at the Washington Navy Yard, and the Air Force laboratory is at the Aerospace Guidance and Metrology Center.

The study team considered seven different alternatives. Consideration was given to the feasibility of consolidating the primary standards laboratories. Study results showed no cost savings for any of the consolidation alternatives. The resulting recommendation is that each Service retain its mission-oriented primary standards laboratory organization.

b. Joint Service decision:

Analysis shows that there is no cost savings attributable to consolidation of Type I calibration services. Maintain the three Type I metrology facilities with each service retaining its mission-oriented Primary Standards Laboratory Organization. (No action.)

13. Landing Gear Study (Air Force)

a. Summary:

This study includes fixed wing and rotary wing aircraft landing gears comprised of the shock absorbing strut and associated equipment attached to the strut, the brake and associated equipment attached to the brake, and the wheel.

The general study approach was to analyze existing and future depot maintenance capability for landing gear repair. Consideration was given to consolidation of workload by Service and by regional area. Resulting recommendations included consolidating selected landing gears (except where precluded by the Navy concurrent repair philosophy and spares position), public-public competition of selected components, and public-private competition of current contract workloads. Specific recommendations include:

(1) Consolidate selected landing gear end items.

(2) Prototype repair of F-14 landing gear by Air Force to test support feasibility.

(3) Public-public competition of selected high repair cost components.

(4) Public-private competition of current contract workloads.

Savings initially identified for this study are $493K. Additional savings are anticipated.

b. Joint Service decision:

(1) Interservice the Navy C-130 landing gear at OO-ALC along with the Navy C-130 Standard Depot Level Maintenance (SDLM). Total C-130 landing gear savings = $493K. (Navy/Air Force action.)

(2) A series of prototype actions will be taken to determine the feasibility of moving additional Navy workload to OO-ALC. One purpose of the prototype will be to test whether the Air Force repair philosophy can be applied to Navy landing gears. Other consolidations will be initiated if the prototype validates a consistent repair philosophy between the Services. The first test will be F-14 landing gears. (Navy/Air Force action.)

(3) Conduct public-private competition on the landing gear components being repaired by commercial sources. (Navy/Air Force/Army action.)

14. Gas Turbine Engine Blade and Vane Study (Air Force)

a. Summary:

This study includes Type II repair (stripping, coating, heat treating, hot isostatic press, welding, and/or grinding) of gas turbine engine blade and vane components. Excluded is Type I repair (cleaning, inspecting, and blending).

The study approach was to analyze blade and vane depot maintenance capability, to determine feasibility of consolidating workloads and to increase capacity utilization. Resulting recommendations included the designation of DOD Type II repair capabilities and competition for certain workloads. Specific recommendations included:

(1) Air Force and Navy maintain a Type II repair capability and consolidate Service internal workloads.

(2) Army Type II workload requirements be offered for public-private competition.

(3) Other Service unique items be identified for public-public competition.

(4) Review items on contract for public-private competition.

(5) Inventory control points take action to achieve maximum capture of retrograde.

Total cost savings identified in this study are $812K.

b. Joint Service decision:

(1) Consolidate all organic Type II blade and vane repair at NADEP Cherry Point and OC-ALC. Cost savings = $812K. (Navy/Air Force action.)

(2) Review items currently on contract for competition with public blade and vane repair facilities. (All Services' action.)

(3) Determine which Army blades and vanes may be subject to Type II repair. As appropriate, these may be considered for either interservicing to OC-ALC or NADEP Cherry Point or for public-private competition. (Army action.)

(4) Conduct public-public competition between the two designated Type II repair sites on all common items and selected unique items. (All Services' action.)

(5) Inventory Control Point action is necessary to properly code blade and vanes as repairable items in order to support capture of retrograde items for support of the rework program. (Service Inventory Control Points action.)

(6) Designate NADEP Cherry Point as repair design activity available for all DOD usage. Other local and manufacturer repair processes developed will be reported to NADEP Cherry Point for cataloging. (All Services' action.)

15. Bearing Study (Air Force)

a. Summary:

This study includes Type II repair (disassembly, polishing, honing, plating, and parts interchange) of aviation bearings. Excluded is Type I repair (cleaning and inspection).

The study approach was to review current and future bearing repair capability and workload and to develop a strategy for savings and improved capacity utilization. Currently, Type II repair capability is at OC-ALC, CCAD, and NADEP North Island and consists of five personnel equivalents per year of workload. Consideration was given to workload consolidation. Recommendations included: (1) Maintaining the three current Type II repair facilities, and (2) Increasing bearing retrograde by capture through reparable coding and initiation of a program with a dual pricing structure for buy versus repair under stock funding of depot level repairables.

No savings attributable to the industrial fund were identified with this study.

b. Joint Service decision:

(1) Maintain the three Level II bearing repair facilities. Level II bearing refurbishment is now a viable program. Significant repair process improvements and technology exchange have taken place between the Services through the ongoing joint bearing repair program. Type II bearing repair is a natural adjunct to the engine repair process and serves mainly as a production flow enhancer. Additional investment for Type II capability beyond that necessary for Type I is minimal and greatly enhances the ability of each of the Services to work around frequent shortages of new production bearings. (No action.)

(2) In order to increase repairable bearing return to depot, appropriate bearings should be coded repairable and inducted into a program with a dual pricing structure for customer buy versus repair under stock funding of depot level repairables. (Service Inventory Control Points action.)

16. Small Arms Study (Marine Corps)

a. Summary:

This study encompasses small arms as defined in DOD 4400.25-M-2, MILSTRAP Manual. This includes automatic rifles, carbines, flame throwers (portable), separate grenade launchers, launchers (portable and reusable), line throwing (portable), machine guns/cannons (up to and including .50 caliber), mortars, pistols (including signaling), recoilless rifles, revolvers, rifles, shotguns, and submachine guns. Excluded were 20-40mm weapons integral to other principal end items.

The small arms program value is approximately $13.4 million compared to the overall DOD-wide program of over $13 billion. The size of the program, in terms of dollars, precludes significant cost savings. Despite this reality, the study group conducted an in-depth examination of the DOD small arms program. This review resulted in the following conclusions:

(1) Small arms workload assignments and distribution have been relatively sound since the late 1970s. This condition resulted from the fact that a previously chartered JLC study group published a report in August 1977 which provided the foundation for interservicing and consolidation actions. This led to achievement of an efficient overall small arms program within DOD. JPCG-DM DMI decisions have further solidified the program.

(2) The existing small arms program is already virtually consolidated at ANAD. For example, 92 percent ($12.326M out of a possible $13.404M) of the FY91 overall small arms depot maintenance program value is located at ANAD. The same consolidation percentage applies for FY92. Additionally, from an interservice standpoint, all Navy and Coast Guard work is consolidated at Naval Weapons Support Center (NWSC) Crane. The Marine Corps small arms workload is centrally managed at MCLB Albany and executed at both MCLB Albany and Barstow. The Marine Corps, however, interservices over one-half of their small arms workload to either NWSC Crane or ANAD. The vast majority goes to the Army at ANAD.

(3) The DOD small arms program is already reasonably interserviced with interservicing progressing to over 12 percent by FY94. Adoption of the recommended Air Force transfer of workload would further increase interservicing.

(4) The above conclusions notwithstanding, benefit would be realized by one further consolidation of workload. Specifically, transfer of the Air Force small arms program from OO-ALC to ANAD would result in cost savings.

DESERT STORM rapid support accomplishments further illustrate the basic validity of the current DOD small arms program. Furthermore, additional interservicing and/or consolidation beyond that recommended herein would be counterproductive to mission accomplishment.

Total cost savings identified in this study are $76K.

b. Joint Service decision:

Transfer all Air Force small arms workload from OO-ALC to ANAD. Cost savings = $76K. (Air Force/Army action.)

17. Ground Communications and Electronics (GCE) Study (Marine Corps)

a. Summary:

This study includes ground radio communications equipment, ground radar, wire communications, communication/cryptologic, electronic sensors, electro-optics, navigation aids, and battlefield automation systems. Excluded are missiles, space-based systems, shipboard communications-electronics (C-E), aircraft C-E, operational software development and maintenance, test program set development and maintenance, test measurement and diagnostic equipment (maintenance, repair and calibration), automated test equipment, as well as electronic systems and equipment design, development, fabrication, prototype test and evaluation, and production.

The team initially identified ten options including movement of Army, Navy, Air Force, and Marine Corps GCE workload on each coast, coast to coast, and to Centers of Technical Excellence. Five options offered the highest economic return, were reasonably achievable, and dealt best with the capacity utilization problems evident at some depots. The five options were analyzed in depth.

The analysis centered on currently funded, and projected to be funded, organic, interserviced and contracted GCE workload for FY91-FY95 and the estimated cost and potential savings to be realized from the transfer of GCE workload from one source of repair to another. Cost factors in the analysis included equipment, facilities, personnel, transportation, production costs, and other factors.

The analysis indicated movement of the GCE workload from SAAD to TOAD would save $40.959M. These savings are attributable to the Army Short-Term Plan. Evaluation of the potential for savings from competition also revealed a potential savings of $59.465M. Total savings identified in this study were over $100 million.

b. Joint Service decision:

(1) Transfer the GCE workload at SAAD to TOAD and ANAD. However, cost savings of $40.959M are attributable to the Short-Term Plan savings and are not countable against the $2.2B goal. Where practical, the Army should conduct public-private competition on above core workload prior to being transferred out of SAAD in order to receive best value. (Army action.)

(2) Layaway excess capacity at TOAD and SM-ALC. (Army/Air Force action.)

(3) Compete (public-private) or interservice above core workload from all GCE depots and current contract workload. Specific candidates must be identified for competition or interservice. Cost savings = $59.465M. (All Services' action.)

18. Industrial Plant Equipment (IPE) Study (DLA)

a. Summary:

This study includes the full range of IPE management in DOD, including mobilization planning, inventory management, general reserve, cataloging, engineering, standardization, specifications preparation, acquisition, storage, and maintenance.

Currently, IPE depot maintenance is conducted at Stockton, CA (DLA), Mechanicsburg, PA (DLA), and Seneca Army Depot (SEAD). In early 1990, DLA and Army conducted a review of IPE depot maintenance. Both DLA and Army recommended further study of DOD IPE management. In July 1990, the DDMC designated DLA as the lead Service for an IPE study. All aspects of DOD IPE management were included in the study conducted from September 1990 through January 1991 as indicated in the following panel identification: Panel A - Inventory management, mobilization planning, and the DOD general reserve; Panel B - Cataloging, specifications, and standardization; Panel C - Acquisition of new IPE; and Panel D - Storage and maintenance. An in-process review group of HQ Service and DLA-level representatives provided oversight, guidance, and the decision-making body.

The study results, as with the earlier maintenance review, found the Army and DLA polarized in disagreement. The Army position has been:

(1) Disestablish DLA's Defense Industrial Plant Equipment Center (DIPEC) and transfer IPE management to the Military Services with IPE being managed in the same way as all other non-consumable property (the NSN based PICA/SICA concept).

(2) Eliminate the DOD General Reserve because it is not cost effective.

(3) Reduce the DOD IPE maintenance and rebuild mission by returning Mechanicsburg and Stockton maintenance facilities to the Navy with the Army retaining SEAD.

Conversely, DLA's position is:

(1) Designate DLA as the single IPE depot maintenance manager.

(2) Centralize all IPE acquisition to DLA.

(3) Assign DLA as the single integrated materiel manager for IPE.

Areas of agreement in the review were: change of IPE criteria to Federal Supply Group (FSG) 34 with value of $15,000 or more and phase out the plant equipment code (PEC) for IPE identification in favor of the NSN. Specifications were to be simplified with commercial/industry specifications versus MILSPECs and the burden of making manual IPE status changes to DIPEC would be replaced with obtaining the data from existing automated systems.

Savings associated with this study are split between DMRD 995 and 908. The DMRD 908 portion is projected to be $10.8M.

b. Joint Service decisions:

(1) Change the scope of IPE from 19 FSGs to only FSG 34 (metal working machines) and increase the threshold from $5,000 to $15,000. (DLA action.)

(2) Phase out PEC and use NSN as the single IPE identifier. (DLA action.)

(3) Use industry standard/commercial specifications for IPE instead of MILSPECs. (DLA action.)

(4) Eliminate manual reporting of IPE status and obtain data from existing automated systems. (DLA action.)

(5) Regarding the General Reserve, the Services and DLA will conduct a scrub of current assets to determine those with anticipated Service requirements. All items that do not have Service validated potential use will be eliminated. Upon completion of this review, continuation of the General Reserve will be evaluated. Any cost savings are attributable to DMRD 995. (DLA and all Service action.)

(6) Regarding consolidation of depot maintenance activities, a cost analysis will be conducted by the IPE Commodity Group based on data from the DIPEC maintenance activities and from SEAD. The cost analysis will be for the six Army IPE items with the most workload to determine if Army maintenance requirements can be met by DLA in a cost effective manner. Cost, production capacity, and benefits to DOD will be identified for both DIPEC and Army facilities. If DIPEC provides the best value, the Army will transfer its organic workload to DLA and disestablish the SEAD IPE maintenance capability, subject to the gaining depot's ability to withstand a production prototype audit. If SEAD provides the best value, the Army will retain SEAD and DLA will reevaluate its requirement for two IPE depots. The Cost Comparability Group will oversee this cost analysis to ensure comparability. Cost savings = $10.8M. (Army and DLA action.)

(7) Regarding centralized acquisition management of IPE, DIPEC will conduct a one-year test to centrally screen IPE acquisitions for duplication. Currently, the Services are required to submit DD Form 1419 for determination of availability from the General Reserve prior to acquisition. During the test period, DLA will also conduct a review of these submissions for duplicate requirements and determination of a single Service lead for procurement of any consolidated requirements. Any cost savings are attributable to DMRD 995. (DLA action.)

SECTION VI

SUMMATION

A. Introduction.

This section summarizes the cumulative impacts of the joint Service decisions and other associated actions being taken to achieve the $2.2 billion savings goal established by OSD.

Due to rounding, not all figures add exactly.

B. Savings.

The cumulative totals of savings ($M) to be applied to goals in the Joint Service Long-Range Plan, resulting from joint deliberations and decisions, are as follows:

Table 6-1 is a summary of savings reflected in this plan as they relate to the goals of the Joint Service Long-Range Plan for Increased Efficiencies. Table 6-2 provides a listing of commodity studies and associated Long-Range DMRD 908 savings of each study.

	Inter-Service	Compe-tition	Consol-idation	Total
Army	6.2	54.2	290.9	351.2
Air Force	42.7	186.7	2.6	232.0
Navy	50.9	437.7	29.0	517.6
Marine Corps	1.0	3.4	0.0	4.4
Total	100.7	682.0	322.5	1105.2

C. Functional Methods for Achieving Targets.

1. Interservice. Workloads approximating 2.1 million direct labor hours will be interserviced. They are estimated to generate $101 million in savings. These interservice actions are expected to increase the total interservicing workload about two percent of the total DOD depot maintenance workload. Assuming that the public sector wins some of the workloads identified for public-private competition in this plan, interservicing workload will be even further increased. Table 6-3 provides specific items/commodities projected for interservicing action.

2. Competition. Approximately $810 million (9.1 million direct labor hours) of the annual organic business base will undergo a public-private or public-public competition. The expected savings for the FY91-FY95 time frame is about $682 million. Table 6-4 provides specific items/commodities projected for competition. These candidates are a result of the commodity group studies and are not inclusive of all those being identified for the ongoing prototype.

3. Consolidation. To improve capacity utilization, organic workloads approximating 4.7 million direct labor hours are being consolidated. In addition, approximately 2.8 million direct labor hours of current contract workload will be consolidated into organic depots. Associated savings are estimated to be about $322 million. There are additional savings to be achieved through divestiture of excess capacity resulting from an increase in interservicing and workload consolidations. They will be identified by the Services in their respective business plans. Table 6-5 provides specific items/commodities projected for consolidation action.

D. Service Summaries.

A summary of saving reflected in this plan as they relate to the goals of the Joint Service Long-Range Plan for Increased Efficiencies is provided as follows for each Service: Army - Table 6-6, Air Force - Table 6-7, Navy - Table 6-8, and Marine Corps - Table 6-9. Specific items/commodities projected for interservicing, competition, or consolidation action are provided as follows for each Service: Army - Table 6-10, Air Force - Table 6-11, Navy - Table 6-12, and Marine Corps - Table 6-13.

E. Workload.

Relative to projected FY91 workload, depot impact from the proposed consolidations and interservicing actions ranges from a 61 percent loss to a 125 percent gain. Workloads which have been identified as competition candidates present some risk to the current depot activity as a potential loss. Though significant gains are possible for those depots which are aggressive in bidding for the over 9.1 million direct labor hours being offered for competition. Table 6-14 shows the percent of workload gains and losses and workload which is at risk due to competition resulting from these decisions.

ALL SERVICES SUMMARY
($M)

TOTAL

	91	92	93	94	95	TOTAL
Long-Term Goal	117.9	259.0	428.7	598.5	795.9	2200.(
Savings	105.3	103.9	173.2	276.3	446.5	1105.:
Balance	12.6	155.1	255.5	322.2	349.4	1094.:

INTERSERVICE

	91	92	93	94	95	TOTA
Long-Term I/S Goal	0.0	15.2	30.3	45.7	60.8	152.
Savings	0.0	7.0	22.6	31.8	39.4	100.
Balance	0.0	8.2	7.7	13.9	21.4	51.

COMPETITION

	91	92	93	94	95	TOTA
Long-Term Comp Goal	101.4	211.4	333.4	487.8	670.0	1804
Savings	91.1	70.8	114.7	188.6	216.8	682
Balance	10.3	140.6	218.7	299.2	453.2	1122

CONSOLIDATION

	91	92	93	94	95	TOTA
Long-Term Cons Goal	16.5	32.4	65.0	65.0	65.1	244
Savings	14.2	26.1	35.9	55.9	190.4	322
Balance	2.3	6.3	29.1	9.1	- 125.3	- 78

SAVINGS BY COMMODITY GROUP

		$M
Air Force		
	Fixed-Wing Aircraft	610.5
	Type I Metrology Lab	0.0
	Landing Gear	0.5
	Engine	50.1
	Blade and Vane	0.8
	Bearings	0.0
Navy		
	Tactical Missile	128.7
	FCIM	0.0
	RPV/UAV	0.6
Army		
	Rotary Wing	53.2
	CAT Vehicle	189.1
	Gas Turbine/Compressor	0.4
	Conventional Munitions	0.0
	Rail	0.8
	General Purpose Eqp	0.2
USMC		
	Small Arms	0.1
	Grd Comm & Electronics	59.5
DLA		
	IPE	10.8
	TOTAL PROJECTED SAVINGS	1105.2

TABLE 6-2

INTERSERVICE SUMMARY

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	PROJECTED SAVINGS ($M)	FROM	TO	WHEN
C-130F/R	58.3	3.2	CHYPT	OO-ALC	'92
F-4	210.0	5.4	OO-ALC	CHYPT	'92
TF-30	299.0	20.5	NORVA	OC-ALC	'92
F-110	190.0	TBD	NORVA	OC-ALC	'92
J-79	190.0	8.4	OC-ALC	CHYPT	'92
LM-2500/TF-39	345.0	13.4	SA-ALC	TBD	'92
C-130 MLG	8.0	0.5	CHYPT	OO-ALC	'92
NAVY TAC MSL	215.1		Contract	LEAD	'93
	102.8		ALMD	LEAD	'92
	14.6		NORVA	LEAD	'94
	144.0		SEAL B	LEAD	'93
MSL-total		26.1			
AF TAC MSL	24.1		Contract	LEAD	'94
	61.5		ALMD	LEAD	'92
	12.7		CRANE	LEAD	'94
	181.0		OO-ALC	LEAD	'93
MSL-total		14.0			
MC TAC MSL	32.2	0.5	Contract	LEAD	'95
UAV-SR	TBD	0.6	TBD	TBD	'95
ARMY GTE	13.9	0.4	TEAD	SA-ALC	'93
INT/RAMP BRID	6.0	0.2	TEAD	MCLBB	'92
SMALL ARMS	1.5	0.1	OO-ALC	ANAD	'92
ARMY GCE	TBD	5.6	All AD's	TBD	'92
AF GCE	TBD	1.4	All ALC's	TBD	'92
NAVY GCE	TBD	0.1	All NADEP's	TBD	'92
MC GCE	TBD	0.5	All MCLB's	TBD	'92
TOTAL	2109.7	100.7			

COMPETITION SUMMARY

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	PROJECTED SAVINGS ($M)	CURRENT SOR	WHEN
E-3	92.0	2.3	OC-ALC	'93
C-135	720.0	25.1	SM-ALC	'93
C-141	399.0	13.5	WR-ALC	'93
B-1	374.0	11.5	OC-ALC	'93
AF C-130	360.0	9.2	OO-ALC	'93
F-15	480.0		SM-ALC	'93
	980.0		WR-ALC	'93
F-15-total		41.0		
F-16	1157.0	32.7	OO-ALC	'93
F-111	360.0	10.5	SM-ALC	'93
A-10	100.0	1.6	SM-ALC	'94
B-52H	484.0	13.5	SA-ALC	'93
S-3	96.0	9.4	ALMD	'93
A-6	84.5		ALMD	'93
	99.2		NORVA	'93
A-6-total		13.9		
A-4	116.0	7.6	CHYPT	'92
T-2	252.0	12.5	JAX	'94
P-3	246.0	17.4	JAX	'92
F/A-18	44.1		JAX	'92
	732.0		NORIS	'92
F/A-18-total		15.6		
E-2/C-2	49.2	3.0	NORIS	'93
F-14 SDLM	--	144.8	NORVA	'91*
A-6 REWING	--	45.5	ALMD	'91*
F-14A TO D	--	157.0	NORVA	'91*
F-4 DRONE	528.0		Contract	'95
	132.0		CHYPT	'95
F-4-total		14.4		
T-56	300.0	7.8	ALMD	'93
	580.0	TBD	SA-ALC	'93
CAT	340.0	20.3	TEAD	'91
100/200KW GEN	85.0	TBD	SM-ALC	'92
ARMY GCE	TBD	33.9	All AD's	'92
AF GCE	TBD	14.4	All ALC's	'92
NAVY GCE	TBD	0.3	All NADEP's	'92
MC GCE	TBD	3.4	All MCLB's	'92
TOTAL	9190.0	682.0		

* ACTION COMPLETE

Aircraft competition candidates may be adjusted upon development of the Air Force Business Plan.

TABLE 6-4

CONSOLIDATION SUMMARY

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	PROJECTED SAVINGS ($M)	FROM	TO	WHEN
BLADE & VANE	40.0	0.5	SA-ALC	OC-ALC	'92
	5.0		ALMD	CHYPT	'92
	5.0		NORVA	CHYPT	'92
	10.0		NORIS	CHYPT	'92
Navy sub-total		0.3			
ARMY MSL	753.0		Contract	LEAD	'94
	197.0		SAAD	LEAD	'94
	363.0		ANAD	LEAD	'93
	489.0		RRAD	LEAD	'92
	59.4		TOAD	LEAD	'94
MSL-total		62.4			
NAVY MSL MCP		17.1			
ARMY MSL MCP		7.3			
NAVY I LEVEL	110.0	1.4	CONC	SEAL B	'92
T-58/T-64	156.0	1.9	NORIS	CHYPT	'92
H64/H-60/H-47	2080.0	46.9	Contract	CCAD	'91
H-46	248.0	4.5	NORIS	CHYPT	'91
MZAD CAT	724.1		MZAD	RRAD	'95
	261.2		MZAD	ANAD	'95
	14.7		MZAD	TEAD	'95
CAT-total		98.0			
CAT SYS LAYAWAY		10.4			
CAT (CMF)		45.7			
SP ARTY	460.0	14.7	LEAD	RRAD	'93
RAIL	0.0		RRAD	TEAD	'91
	0.0		NCAD	TEAD	'91
rail-total		0.8			
GRD COM & ELE	100.6	NA	SAAD	ANAD	'93
	813.4	NA	SAAD	TOAD	'93
ARMY IPE	291.0	4.8	TBD	TBD	'93
AF IPE	112.0	2.1	TBD	TBD	'93
NAVY IPE	223.0	3.9	TBD	TBD	'93
TOTAL	7515.4	322.5			

TABLE 6-5

ARMY SUMMARY of SAVINGS
($M)

TOTAL

	91	92	93	94	95	TOTAL
Long-Term Goal	3.0	9.7	57.7	100.1	142.4	312.9
Savings	5.3	31.3	42.9	69.3	202.3	351.2
Balance	-2.3	-21.6	14.8	30.8	-59.9	-38.3

INTERSERVICE

	91	92	93	94	95	TOTAL
Long-Term I/S Goal	0.0	3.8	7.6	11.4	15.2	38.0
Savings	0.0	0.6	1.1	2.0	2.5	6.2
Balance	0.0	3.2	6.5	9.4	12.7	31.8

COMPETITION

	91	92	93	94	95	TOTAL
Long-Term Comp Goal	0.0	0.0	38.4	77.0	115.5	230.9
Savings	0.0	4.8	10.6	16.5	22.3	54.2
Balance	0.0	-4.8	27.8	60.5	93.2	176.7

CONSOLIDATION

	91	92	93	94	95	TOTAL
Long-Term Cons Goal	3.0	5.9	11.7	11.7	11.7	44.0
Savings	5.3	26.0	31.1	50.9	177.5	290.9
Balance	-2.3	-20.1	-19.4	-39.2	-165.8	-246.9

TABLE 6-6

AIR FORCE SUMMARY of SAVINGS
($M)

TOTAL

	91	92	93	94	95	TOTAL
Long-Term Goal	5.9	81.3	130.5	200.1	301.6	719.4
Savings	0.0	4.9	43.6	82.0	101.5	232.0
Balance	5.9	76.4	86.9	118.1	200.1	487.4

INTERSERVICE

	91	92	93	94	95	TOTA
Long-Term I/S Goal	0.0	5.6	11.2	16.9	22.5	56.
Savings	0.0	3.2	10.0	13.6	15.9	42.
Balance	0.0	2.4	1.2	3.3	6.6	13.

COMPETITION

	91	92	93	94	95	TOTA
Long-Term Comp Goal	0.0	64.0	95.9	159.8	255.7	575
Savings	0.0	1.6	32.8	67.5	84.8	186
Balance	0.0	62.4	63.1	92.3	170.9	388

CONSOLIDATION

	91	92	93	94	95	TOT
Long-Term Cons Goal	5.9	11.7	23.4	23.4	23.4	87
Savings	0.0	0.1	0.8	0.8	0.9	2
Balance	5.9	11.6	22.6	22.6	22.5	85

TABLE 6-7

NAVY SUMMARY of SAVINGS
($M)

TOTAL

	91	92	93	94	95	TOTAL
Long-Term Goal	108.8	167.5	237.9	293.6	345.2	1153.0
Savings	100.0	67.6	86.1	123.6	140.3	517.6
Balance	8.8	99.9	151.8	170.0	204.9	635.4

INTERSERVICE

	91	92	93	94	95	TOTAL
Long-Term I/S Goal	0.0	5.6	11.2	16.9	22.5	56.2
Savings	0.0	3.1	11.4	16.0	20.4	50.9
Balance	0.0	2.5	-0.2	0.9	2.1	5.3

COMPETITION

	91	92	93	94	95	TOTAL
Long-Term Comp Goal	101.4	147.4	197.4	247.4	293.4	987.0
Savings	91.1	64.4	70.7	103.4	108.0	437.7
Balance	10.3	83.0	126.7	144.0	185.4	549.3

CONSOLIDATION

	91	92	93	94	95	TOTAL
Long-Term Cons Goal	7.4	14.5	29.3	29.3	29.3	109.8
Savings	8.9	0.0	4.0	4.2	12.0	29.0
Balance	-1.5	14.5	25.3	25.1	17.3	80.8

TABLE 6-8

MARINE CORPS SUMMARY of SAVINGS
($M)

TOTAL

	91	92	93	94	95	TOTAL
Long-Term Goal	0.2	0.5	2.6	4.7	6.7	14.7
Savings	0.0	0.1	0.6	1.3	2.4	4.4
Balance	0.2	0.4	2.0	3.4	4.3	10.3

INTERSERVICE

	91	92	93	94	95	TOTAL
Long-Term I/S Goal	0.0	0.2	0.3	0.5	0.6	1.6
Savings	0.0	0.1	0.1	0.2	0.6	1.0
Balance	0.0	0.1	0.2	0.3	0.0	0.6

COMPETITION

	91	92	93	94	95	TOTAL
Long-Term Comp Goal	0.0	0.0	1.7	3.6	5.4	10.
Savings	0.0	0.0	0.5	1.2	1.7	3.
Balance	0.0	0.0	1.2	2.4	3.7	7.

CONSOLIDATION

	91	92	93	94	95	TOTA
Long-Term Cons Goal	0.2	0.3	0.6	0.6	0.7	2.
Savings	0.0	0.0	0.0	0.0	0.0	0.
Balance	0.2	0.3	0.6	0.6	0.7	2.

ARMY SUMMARY of ACTIONS

COMPETITION

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	FY91-FY95 SAVINGS ($M)	CURRENT SOR	TO	WHEN
CAT COMPONENTS	340.0	20.3	TEAD		'92
GRD COM & ELE	TBD	33.9	All ADs		'92
sub-total	340.0	54.2			

INTERSERVICE

GAS TURBINE ENGINE	13.9	0.4	TEAD	SA-ALC	'93
INT/RAMP BRIDGE	6.0	0.2	TEAD	MCLBB	'92
GRD COM & ELE	TBD	5.6	All AD's	TBD	'92
sub-total	19.9	6.2			

CONSOLIDATION

TAC MISSILE	753.0		Contract	LEAD	'94
	197.0		SAAD	LEAD	'94
	363.0		ANAD	LEAD	'93
	489.0		RRAD	LEAD	'92
	59.4		TOAD	LEAD	'94
MSL-total		62.4			
MISSILE MCP		7.3			
H64/H-60/H-47	2080.0	46.9	Contract	CCAD	'91
MZAD CAT	724.1		MZAD	RRAD	'95
	261.2		MZAD	ANAD	'95
	14.7		MZAD	TEAD	'95
MZAD-total		98.0			
CAT SYS LAYAWAY		10.4			
CAT (CMF)		45.7	TEAD	TEAD	'93
SP ARTY	460.0	14.7	LEAD	RRAD	'93
RAIL	0.0		RRAD	TEAD	'91
	0.0		NCAD	TEAD	'91
rail-total		0.8			
GRD COM & ELE	100.6	0.0	SAAD	ANAD	'93
	813.4	0.0	SAAD	TOAD	'93
IPE	291.0	4.8	TBD	TBD	'93
sub-total	6606.4	291.0			
TOTAL	6966.3	351.2			

TABLE 6-10

AIR FORCE SUMMARY of ACTIONS

COMPETITION

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	FY91-FY95 SAVINGS ($M)	CURRENT SOR	TO	WHEN
E-3	92.0	2.3	OC-ALC		'93
C-135	720.0	25.1	SM-ALC		'93
C-141	399.0	13.5	WR-ALC		'93
B-1	374.0	11.5	OC-ALC		'93
C-130	360.0	9.2	OO-ALC		'93
F-15	480.0		SM-ALC		'93
	980.0		WR-ALC		'93
F15-total		41.0			
F-16	1157.0	32.7	OO-ALC		'93
F-111	360.0	10.5	SM-ALC		'93
A-10	100.0	1.6	SM-ALC		'94
B-52H	484.0	13.5	SA-ALC		'93
F-4 DRONE	528.0	11.5	Contract		'95
T56	580.0	TBD	SA-ALC		'93
100/200KW GEN	85.0	TBD	SM-ALC		'92
GRD COM & ELE	TBD	14.4	All ALC's		'92
sub-total	6699.0	186.7			

INTERSERVICE

F-4	210.0	5.4	OO-ALC	CHYPT	'92
J-79	190.0	8.4	OC-ALC	CHYPT	'92
LM-2500/TF-39	345.0	13.4	SA-ALC	TBD	'92
TAC MISSILE	24.1		CONTRACT	LEAD	'94
	61.5		ALMD	LEAD	'92
	12.7		CRANE	LEAD	'94
	181.0		OO-ALC	LEAD	'93
MSL-total		14.0			
SMALL ARMS	1.5	0.1	OO-ALC	ANAD	'92
GRD COM & ELE	TBD	1.4	All ALC's	TBD	'92
sub-total	1025.8	42.7			

CONSOLIDATION

BLADE & VANE	40.0	0.5	SA-ALC	OC-ALC	'92
IPE	112.0	2.1	TBD	TBD	'93
sub-total	152.0	2.6			
TOTAL	7876.8	232.0			

Aircraft competition candidates may be adjusted upon development of the Air Force Business Plan.

NAVY SUMMARY of ACTIONS

COMPETITION

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	FY91-FY95 SAVINGS ($M)	CURRENT SOR	TO	WHEN
S-3	96.0	9.4	ALMD		'93
A-6	84.5		ALMD		'93
	99.2		NORVA		'93
A-6-total		13.9			
A-4	116.0	7.6	CHYPT		'92
T-2	252.0	12.5	JAX		'94
P-3	246.0	17.4	JAX		'92
F/A-18	44.1		JAX		'92
	732.0		NORIS		'92
F/A-18-total		15.6			
E-2/C-2	49.2	3.0	NORIS		'93
F-14 SDLM	0.0	144.8	NORVA		'91*
A-6 REWING	0.0	45.5	ALMD		'91*
F-14A TO D	0.0	157.0	NORVA		'91*
F-4 DRONE	528.0	2.9	CHYPT		'95
T-56	300.0	7.8	ALMD		'93
GRD COM & ELE	TBD	0.3	All NADEPs		'92
sub-total	2547.0	437.7			

*ACTION COMPLETE

INTERSERVICE

C-130F/R	58.3	3.2	CHYPT	OO-ALC	'92
TF-30	299.0	20.5	NORVA	OC-ALC	'92
F-110	190.0	TBD	NORVA	OC-ALC	'92
C-130 MLG	8.0	0.5	CHYPT	OO-ALC	'92
TAC MISSILE	215.1		Contract	LEAD	'93
	102.8		ALMD	LEAD	'92
	14.6		NORVA	LEAD	'94
	144.0		SEAL B	LEAD	'93
MSL-total		26.1			
UAV-SR	TBD	0.6	TBD	TBD	'95
GRD COM & ELE	TBD	0.1	All NADEPs	TBD	'92
sub-total	1031.8	50.9			

TABLE 6-12

NAVY SUMMARY of ACTIONS (Cont'd)

CONSOLIDATION

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	FY91-FY95 SAVINGS ($M)	CURRENT SOR	TO	WHEN
BLADE & VANE	5.0		ALMD	CHYPT	'92
	5.0		NORVA	CHYPT	'92
	10.0		NORIS	CHYPT	'92
B & V-total		.3			
MISSILE MCP		17.1			
I LEVEL MSL	110.0	1.4	CONC	SEAL B	'92
T-58/T-64	156.0	1.9	NORIS	CHYPT	'92
H-46	248.0	4.5	NORIS	CHYPT	'91
IPE	223.0	3.9	TBD	TBD	'93
sub-total	737.0	29.0			
TOTAL	4315.8	517.6			

TABLE 6-12 (CONT'D)

MARINE CORP SUMMARY of ACTIONS

COMMODITY	ANNUAL WORKLOAD (K-DLH's)	FY91-FY95 SAVINGS ($M)	CURRENT SOR	TO	WHEN
COMPETITION					
GRD COM & ELE	TBD	3.4	All MCLB's		'92
sub-total		3.4			
INTERSERVICE					
TAC MISSILE	32.2	0.5	Contract	LEAD	'95
GRD COM & ELE	TBD	0.5	TBD	TBD	'92
sub-total	32.2	1.0			
TOTAL	32.2	4.4			

TABLE 6-13

DEPOT IMPACT

	Workload Change (% of '91 Workload)	Workload at Risk to Competition (% of '91 Workload)
Army Depots		
Sacramento	-61%	0%
Anniston	0%	0%
Corpus Christi	52%	0%
Letterkenny	125%	0%
Red River	30%	0%
Tobyhanna	20%	0%
Tooele	- 7%	15%
Air Force Air Logistics Centers		
Ogden	-5%	21%
San Antonio	-4%	13%
Sacramento	0%	25%
Warner-Robins	0%	20%
Oklahoma City	4%	6%
Marine Corps Logistic Base		
Barstow	1%	0%
Navy Aviation Depots		
Alameda	-6%	6%
Cherry Point	28%	15%
Jacksonville	0%	20%
Norfolk	-16%	3%
North Island	-19%	33%

TABLE 6-14

POLICY AND PROCEDURES FOR AWARDING DEPOT MAINTENANCE INTERSERVICE WORKLOAD

Under the auspices of the Defense Depot Maintenance Council (DDMC), the Services are conducting studies of major commodities to assess opportunities for increased interservicing of workload to reduce total defense depot maintenance costs. The commodity studies are intended to identify candidates that are capable of being interserviced; e.g., is there adequate technical data, capability and capacity exists or can they be achieved to support the requirement, and are there operating economics and real savings to be gained through interservicing?

Interservicing can be considered a form of competition in that a Service (or Services) is designated, on the basis of capability and performance, as having repair/overhaul responsibilities for all DOD components with depot maintenance requirements for the interserviced item or commodity. While the workload may be awarded noncompetitively, the principal (requiring) Service, as well as the agent (performing) Service, should consider interservicing a business agreement with specific terms and conditions of requirements and performance, similar to those which apply to a commercial contract for depot maintenance, to protect the participating Services' interests. Within this context, the following policy and procedures apply to the awarding of depot maintenance workload, noncompetitively, between DOD components.

POLICY: Interservice workload will be awarded to a performing Service on the basis of a proposal specifying cost, quality and schedule commitments that are acceptable to the requiring Service. The requiring Service has a fiduciary responsibility to ensure that the proposal represents the best value for the funding. All proposals must be capable of being audited by the requiring Service. The final decision to award workload to the performing Service is the sole responsibility of the requiring Service. In the evaluation process, if agreement between Services cannot be reached, the issues are presented to the JPCG-DM for resolution through majority vote.

Phase 1 - Requirement Review. Service representatives meet to quantify workload requirements and to conduct preliminary evaluation of capability/capacity of the prospective performing Service.

Phase 2 - Statement of Work. Requiring Service prepares a statement of work in sufficient detail to permit the prospective performing Service to assess the feasibility and desirability of performing the work. Terms and conditions of the requiring Service should be specific.

Phase 3 - Technical Data Review. Requiring Service provides access to all technical publications, maintenance specifications (including Service-unique) and engineering drawings that apply to the weapon system and/or associated components. The requiring Service will make available appropriate expert personnel to assist in the assimilation/interpretation of these data.

Phase 4 - Proposal. Prospective performing Service prepares a detailed cost, quality, schedule proposal. The proposal must respond to the statement of work, be detailed in terms of deliverables, and be capable of being audited by the requiring Service. The audit will be conducted at the request of the requiring Service and can only be waived by the requiring Service. All appropriate data supporting the proposal will be made available by the prospective performing Service.

Phase 5 - Evaluation. The requiring Service will conduct an evaluation of the proposal. Evaluation criteria will be made available to the prospective performing Service. Audits will be conducted at the discretion of the requiring Service. If the proposal is unacceptable, the requiring Service will conduct a complete review of the proposal and the results of the audit with the prospective performing Service.

Phase 6 - Pre-Production Prototype. At the discretion of the requiring Service, assets will be made available to the prospective performing Service to conduct a prototype production test. The results of the test will be evaluated by representatives of the requiring and performing Services. All related data will be made available to the evaluation team. Only the requiring Service can waive this requirement.

Phase 7 - Award of Depot Maintenance Interservice Support Agreement (DMISA). The requiring and performing Services negotiate and sign an agreement that has the force of a contract. The terms and conditions of the statement of work and the proposal will form the basis of the DMISA. The DMISA will normally be a fixed price for a specific workload over a specified period of time. Failure to perform as agreed constitutes cause for cancellation of the DMISA. Periodic program reviews will be conducted to assess performance and make appropriate adjustments to terms and conditions.

DEFENSE DEPOT MAINTENANCE COUNCIL

COST COMPARABILITY COMMITTEE

COST COMPARABILITY HANDBOOK

23 JANUARY 1992

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CERTIFICATION

This handbook is authorized for release to the lead service study groups for test and evaluation. It is realized that this will be a living document that will require modification with time, experience and changing conditions. We wish to express our sincere appreciation to the committee members for their assistance in formulating this handbook.

John Stallings
HQ AFLC/MAW
Chairperson

John S.W. Faroher, Jr.
NADEP Cherry Point
NAVY Representative

James J. McGlone
HQ AMC AMCRM-FPA
ARMY Representative

Abner J. Morris
Marine Corps Albany
MARINE Representative

PURPOSE

The purpose of this handbook is to provide standardized procedures and techniques to insure cost comparability during consolidation studies and when competing depot maintenance workloads between DOD components (public/public) and between organic (DOD) sources and the private sector (public/private).

There are some differences in accounting for costs between the services and even between different locations within the same service. These variances are a result of the managerial and organizational philosophy of the respective service. These differences as covered in Appendix A must be addressed in order to 'level the playing field' before workloads can be compared or competed between DOD agencies and private industry.

The comparability measurements are in two segments. The first segment is the end item cost to the customer. It is anticipated that competition will decrease cost to the government by forcing economy and efficiency at the source of repair. Cost efficient, well managed operations will prosper and grow while the inefficient operations will be reduced. This process of natural selection based on a 'free market economy' will result in reduced duplication of capability, increased capacity utilization and reduced costs to the customer. The second layer of cost comparison is the cost to DOD. There are certain costs that are funded by other appropriations (other than the customer) these include military construction, equipment and transportation costs. These costs must be accounted for before a rational source selection decision can be made. The total cost to DOD is one of the decision criteria.

This handbook is intended to facilitate these comparisons.

BACKGROUND

In June 1990, the Under Secretary of Defense established the Defense Depot Maintenance Council in a memorandum titled "Strengthening Depot Maintenance Activities." The Council chartered the cost comparability committee (reference Appendix D) to establish a technique to compare depot maintenance costs from all providers (public or private) using standard accounting techniques. The specific tasking (reference Appendix B) of the cost comparability committee was to "develop a handbook that would facilitate cost comparability between and among the depot maintenance activities". The objectives of the committee were to:

1. "Level the playing field" for cost comparison in preparation for workload consolidation studies and competitive bidding for workloads. Identify differences and establish a technique for leveling.

2. Establish a uniform methodology for unit costing, recognizing that there are four distinct functions: cost estimating, cost tracking, cost comparison procedures, and the bid processes.

3. Lay the ground work for a uniform DOD depot maintenance cost accounting procedures by providing feedback and recommended changes to DOD 7220.9M.

4. Develop a handbook that can be used to perform cost comparisons.

After an in-depth review of the services cost accounting procedures and cost accounts, the committee found that there were more similarities than differences between each services' cost accounting practices. The committee observed indirect cost accounts that warranted definition which are provided in Appendix A. Those indirect cost accounts that had service variances are listed in the Summary of Adjustments Matrix on page A-3. Adjustments will be made in either direction when they are significant. This handbook is the result of the committee's efforts.

SCOPE

The application of this handbook is limited to costing procedures for workload decisions under the auspices of the Defense Depot Maintenance Council. The rules and procedures identified by this handbook will be applicable to all industrially funded DOD depot maintenance functions and any other government activity that is proposing to compete for depot maintenance work. These rules and procedures will be valid as long as there are no significant changes in accounting classifications, systems and categories of costs.

This document incorporates governmental cost accounting conventions with standard accounting practices in industry and with generally accepted accounting principles. Because of service differences, manual cost adjustments are necessary to facilitate comparability.

The following is a partial quote from the Congressional Record - House dated October 23, 1990:

> "The conferees agree to suspend section 2466 of title 10, United States Code, in order to allow an evaluation of a pilot program for competition of depot maintenance workload in the Army and Air Force. In carrying out this program, the Secretary shall insure that all DOD activities competing for depot maintenance workload are required to submit bids based on comparable estimates for direct and indirect cost factors. In addition, the Secretary shall insure that any successful bid includes estimates for all direct and indirect cost factors, including all direct and indirect cost factors included in bids submitted by private firms."

ASSUMPTIONS:

1 Interservice competition between DOD depot maintenance facilities as well as competition between DOD maintenance facilities and commercial sources is feasible, prudent and legal.

2. In order to effect free and open competition this handbook assumes that there will be no constraints on depot maintenance manpower. Manpower will be allowed to fluctuate up or down in order to accommodate competitive workloads that are won or lost. It must be realized that there are inherent risks in the competitive process.

3. The rate stabilization requirements will be waived in order to prepare bids that reflect the actual and estimated costs at time of the bid. Once the "contract/work agreement" is awarded, the rates and prices will be "locked in" for the period specified in the contract(s) and thus stabilized.

4. Acquisition of capital equipment to perform a competed workload by DOD agencies will be allowed when their proposal (including the cost of acquisition) provides the best overall value to DOD, so long as compliance with established procedures for financing the acquisition of capital equipment are followed.

5. All proposals will be based on the same terms and conditions, including quantities, delivery schedules and work specifications.

6. Existing cost accounting systems will be used and will be in compliance with Cost Accounting Standards (FAR Part 30). The only exception is for public as adjusted for criteria contained in Appendix A and other DOD directives.

7. Competition will be conducted in accordance with the Federal Acquisition Regulation (FAR) for private offerors and using similar rules as amended by the Request For Proposal for public offerers.

FINANCIAL POLICIES FOR COMPARISON/BID PREPARATION

This handbook establishes the financial policies regarding bid preparation for workload subject to public/private and public/public competitions or consolidation at industrially funded depot activities. Consistent with this policy the following specific financial guidance and procedures are provided for proposal preparation.

1. General

a. In developing competitive cost proposals for public to public or consolidation studies, a workload allocation base upon which the bids will be developed will include approved core, current funded non-core, and the specific workload covered under the bid. Other potential workloads will not be considered for costing purposes when competing for a workload public to public. For public/private bids, however, a best estimate of the workload that could be won as a result of competition may be included for general and administrative expense absorption. This estimate should be approved by the management command of the activity and supported by previous competition results.

b. Generally accepted accounting principles will be followed. These principles will be in compliance with Cost Accounting Standards (CAS) except for public as adjusted by Appendix A and other DOD directives.

c. Consolidation or competitive proposals will only include estimated costs for the work specified in the Statement of Work (SOW). In cases where industry and/or practice would indicate work inclusion any specific work intended to be omitted or accomplished only on an "as required by inspection" basis will be clearly identified in the Request for Proposal (RFP) response.

d. Cost elements and allocation procedures for overhead expenses will be the same for all work at the depot which is competing or being considered for consolidation.

e. Noncompetitive workload will not be used to finance costs that according to generally accepted accounting principles should be a proper cost to the competitive workload.

f. Cost proposals should be based on the current best estimate of costs to accomplish the job. They will include an appropriate share of overhead based on the actual/planned workload at the activity. This does not equate to the stabilized rate developed for the Congressional budget but rather the current estimate of costs at the time of bid submission.

g. Management discounts or other "bottom line" adjustments to price may not be offered.

h. Information specifically related to the development of rates and prices must be appropriately marked 'FOR OFFICIAL USE ONLY' and 'SOURCE SELECTION SENSITIVE' as appropriate.

i. All comparisons are based on a unit price basis and are extended by the proposed customer quantity in order to provide a baseline for adjustments.

j. These cost procedures are designed to guide decision making for lead service consolidation and competitive award of workload when applicable. All of the depot maintenance cost associated with the production of the workload under consideration for competition or consolidation will be identified and accounted for in accordance with DOD 7220.9M, the indirect cost elements definitions outlined in Appendix A, and the assumptions that were listed previously. All of these costs will be included in the bid and exceptions will be clearly quantified and identified on the cost comparability work sheet, page 14, Figure 2.

k. All costs will be included without regard to funding source (appropriated or Industrial Funds).

l. After award the following will apply: Public assignment within a Service will be handled by that Service; Public assignment to another Service will be covered by a Depot Maintenance Interservice Support Agreement (DMISA) containing all the terms and conditions specified in the solicitation; Award to private industry will be covered by the normal contracting process with terms and conditions as contained in the solicitation.

2. Cost Proposal Development

a. A total unit cost will be developed by estimating the production hours required to accomplish the contract line items in the statement of work and multiplying the hours by the direct labor and overhead rates developed for the bid. The rate will be independent of any previously established rates developed in the industrial fund budget. Direct material and other costs will be added to the total labor and overhead costs to arrive at a bid price.

b. For public to public competitions, when dealing with commodities (such as Federal Stock Class, commodity, or other logical groupings) that include a large number of items the following will apply:

(1) The cost evaluation will be based on those units that constitute 80% of the cost in the commodity under consideration.

(2) Unit cost will be the basis for each item within the 80% criteria.

c. Unit cost will also be used for workloads which are considered services or which are normally sold at hourly sales rates. This requires that the deliverable(s) can be defined The unit then becomes the defined deliverable(s). The key becomes how the unit/deliverable(s) are defined (ie., one each job, etc). If a deliverable(s) can not be defined, then this handbook does not apply.

3. Gains and Losses

A bid will not knowingly include either a gain or a loss for the specific elements of work covered by the bid. A gain is an excess of revenue over costs incurred. A gain occurs when the contract workload is executed below the contract price as awarded A loss occurs when costs incurred exceed revenues.

(1) Gains incurred during execution of the work will be retained and separately identified within a distinct accumulated operating result account.

(2) If financial problems arise during the execution of the work assignment document, the performing depot should notify their command for assistance in resolving the problem. The depot should notify their command when a loss is expected on a fixed price, project order funded work assignment. The depot and command will review the cause for the loss. If the cause is determined to be beyond the control of the performing activity, the customer will be contacted in an attempt to recover the loss. If the loss is the responsibility of the performing activity the normal loss recovery procedures will apply.

4. Overhead

a. No cost may be allocated to a final product under competition as an indirect cost if similar costs are charged as direct to the same or similar products or workloads not under competition (i.e. allocation procedures must be rational and consistent).

b. General and Administrative (G&A) overhead expenses will use a consistent method for application to all workloads. Any changes in the method for developing G&A rates will be applied consistently to all workloads both competitive and noncompetitive.

c. Changes in overhead expense development and allocation procedures directed subsequent to a competitive cost proposal will apply to the competition workload during execution. Any gains or losses caused by these changes will be included in the final accounting of actual costs against the contract bid price.

d. Production overhead expenses will be applied to the benefiting product.

e. Asset depreciation is an overhead expense.

f. The following functions can be charged as either direct or as production overhead/shop indirect (charged as overhead to the benefiting product or depot service) for the fixed price portion of the proposal only: First line supervision, production testing (POL), Test/Inspections/Verification and Overtime/Holiday Premium. Unless otherwise stated in the RFP, the above functions may be charged as direct for all portions of the proposal that calls for a level-of-effort or charging a rate per hour for unpriced over and above work.

5. Over and Above Work (Within Scope Changes)

a. Competitive cost proposals will be based on the specific Statement of Work (SOW) in the solicitation document. Any work requirement identified subsequent to the award of a contract is considered to be over and above the contracted workload.

b. Costs associated with over and above work must be accounted for separately and be available for audit.

6. Changes to the Statement of Work (SOW) will be separately justified and negotiated with the requiring activity. It must be funded and included in the contract by modification.

7. Reporting and Audit

All costs and revenue applicable to competitive workload will be separately reported and be auditable. The information in the format shown at Figure 1 will be submitted by each Industrial Fund activity performing competitive workload. The report should be included in the quarterly financial and operating statement.

COMPETITIVE PROGRAM
QUARTERLY FINANCIAL REPORT

DEPOT	DATE:	
	PRIOR YEARS CUMULATIVE	**CURRENT FYTD**
ORDERS RECEIVED		
REVENUE		
COST INCURRED (All direct costs, associated overhead and surcharges)		
DIRECT LABOR HOURS WORKED (ACTUAL)		
WORK IN PROCESS		
UNITS INDUCTED		
UNITS PHYSICALLY COMPLETE		
UNITS FINANCIALLY COMPLETE		

Figure 1

COST COMPARABILITY/BID WORKSHEET INSTRUCTIONS
(Figure 2)

GENERAL

This format will be completed for all workloads under consideration for consolidations and subsequently during the competitive process Cost will be developed based on the rules and procedures contained in the other sections of this handbook. All cost will be shown regardless of funding sources (Industrial Fund or Appropriations). All costs identified in Appendix A will be included unless an adjustment for comparability is indicated. The cost elements in Lines 17 through 24 of the format have been identified as potential areas for adjustments to make cost from the different services comparable. USE EACH ELEMENT ONLY IF IT IS APPROPRIATE FOR INDIVIDUAL COST COMPARISONS. Primarily for competition, negative adjustments will not exceed the amount for the cost element included in the customers cost/bid (line 16). For example, if the customer will be providing all weapon system engineering support, the RFP would state that this cost will not be included in the cost proposal. Thus, no adjustment would be needed in Line 17. The cost elements identified in this section are discussed in detail in Appendix A and major areas are summarized here for clarity.

COMPARABILITY ADJUSTMENTS:

A. Engineering - Design engineering normally referred to as Weapon System Engineering includes designing repairs and modifications, configuration management, monitoring reliability data (including engineering decisions on materials specifications) and weapon systems performance, maintaining technical data, and technical support of production. Weapon System Engineering is considered a cost to the customer and not depot maintenance. Therefore, where weapon system engineering is included as industrial fund costs, these costs should be identified, quantified, and recorded in the appropriate line of this worksheet.

B. Supply - Supply cost is considered a cost of supply/vendor not depot maintenance (except through surcharges). Therefore, where the supply function operates and maintains a receiving, storage and shipping function for non-Industrial Fund (IF) owned material and the IF activity bears a significant portion of the cost of this operation, these costs should be identified and excluded.

C. Equipment Depreciation - The depreciation of industrial plant equipment, minor construction and data systems is a cost of doing business and will be included. The depreciation for base operating support functions that provided services to the Industrial Fund (IF) will be excluded in the consolidation studies for the same reasons facility depreciation was excluded. It will be included under public to private competition.

D. Base Support Cost - In locations where the industrial funded operations are the 'host', the operation may carry a greater share of these costs than if the Industrial Fund (IF) was the tenant. Therefore, non-reimbursed expenses incurred by the IF host in support of tenant or satellite units should be identified and excluded.

E. Unfunded Civilian Retirement - Under the old Civil Service Retirement System (CSRS), not all government liability for employee retirement was included. However, with the changes to the Civilian Retirement System in the Mid 1980s and the introduction of the FAR, this is no longer true. Therefore, an adjustment may have to be made in the proposal. This adjustment will equate to the amount of unfunded civilian retirement liability the government bidders will incur based on the number of employees still covered by the CSRS and associated with the specific bid under consideration. When computing this amount, a percentage of payroll will be used. This percentage can be obtained from the Office of Personnel Management (OPM).

F. Depreciation for MCP Facilities - The depreciation of existing facilities constructed with Military Construction Program (MCP) funds will be considered a sunk cost and will be excluded in the consolidation studies or public to public competitions. When competing with private industry, depreciation costs for existing facilities will be included for ALL bidders and the amount entered on line 22 of the worksheet. New construction, regardless of the funding source, should be part of the selection process as a separate item of consideration as identified on the worksheet (line 27).

G. Other Recurring Costs - Recurring costs are those costs that change (increase/decrease) as a result of Source Of Repair (SOR) selection, i.e. Second Destination Transportation (SDT) costs due to different geographical locations.

H. Other - Depending on the situation (public/public or public/private) there may be a need to make additional adjustments not covered in the items above such as government only cost or military cost not depot maintenance related or Depot Level Reparable (DLR) surcharge until all services have implemented DMRD 904. Any costs in this area must be fully identified and justified (see Summary of Adjustments Matrix).

All costs to DoD have to be considered when evaluating workload consolidation or competitive bid awards. Therefore all recurring and nonrecurring costs must be considered in determining the best value for DoD. Nonrecurring costs are those one time costs incurred as a result of a workload move decision. Recurring costs that are the result of the consolidation or bid award decision will continue as long as the decision is in place. Below is a list of costs associated with moving a workload from one Source of Repair (SOR) to another SOR. This list is not all inclusive. Other costs may be included or excluded as the

individual competition or consolidation requires. However, any additions or deletions to these costs must be fully identified and justified. Costs that may not be included are facility/equipment shutdown costs, parts inventory, production engineering, transition management, Reduction In Force (RIF), and Conventional Forces Agreement (CFA). Any assumption made in developing these costs must also be clearly stated.

OTHER DOD NON RECURRING:

A. Capital Expenditures - The movement of workloads may require modifications to existing facilities or construction of new facilities. The cost of modifications will include both physical alterations and the plant engineering/layout costs. It also includes any additional equipment required.

B. Transfer/Relocation Expenditures - The relocation of industrial capacity/capability results in additional expenditures for personnel separation or relocation, personnel retraining/training, learning curve, industrial assets transfer (disassembly/reassembly, packaging, handling, storage, and transportation), etc. These adjustments are only appropriate for public/public competitions or consolidations. The Joint Service Depot Maintenance Interservicing Regulations apply.

C. Changes in Spares - The amount of pipeline spares that would increase or decrease as a result of the alternatives under consideration. The changes in spares due to changes in repair times, transportation days, etc.

D. Other - Costs relative to the specific competition allowable under the RFP.

COMPARABILITY/BID PROPOSAL WORKSHEET

1. DEPOT:	2. DATE:
3. SOLICITATION NUMBER:	4. CUSTOMER:
5. PROJECT BRIEF:	

6. CUSTOMER QUANTITY 7. EST HOURS PER UNIT BASIS: STANDARD OR ACTUAL HOURS

	COST CATEGORY	8. COST PER HOUR	9. COST PER UNIT	10. TOTAL PROJECT COST
11	DIRECT LABOR			
12	DIRECT MATERIAL			
13	OTHER DIRECT			
14	PRODUCTION OVERHEAD (INDIRECT)			
15	GENERAL & ADMINISTRATIVE EXPENSE			
16	CUSTOMER COST (TOTAL LINES 11 THROUGH 15)			
	COMPARABILITY ADJUSTMENTS			
17	ENGINEERING			
18	SUPPLY			
19	EQUIPMENT DEPRECIATION			
20	BASE SUPPORT COST			
21	UNFUNDED CIVILIAN RETIREMENT			
22	DEPRECIATION FOR MCP FACILITIES			
23	OTHER RECURRING COST			
24.	OTHER			
25	TOTAL COMPARABILITY ADJ (TOTAL LINES 17 THROUGH 24)			
26.	DEPOT MAINTENANCE COMPARABILITY COSTS (LINE 16 + LINE 25)			
	OTHER DOD NON-RECURRING			
27.	CAPITAL EXPENDITURES	X	X	
28	TRANSFER/RELOCATION EXPENDITURES	X	X	
29.	CHANGES IN SPARES	X	X	
30.	OTHER	X	X	
31.	TOTAL OTHER DOD NON-RECURRING COSTS (TOTAL LINES 27 THROUGH 30)	X	X	
32.	TOTAL ALTERNATIVE COSTS (LINE 26 + LINE 31)			

Figure 2

LINE ITEM DESCRIPTION

Item 1 [Depot]: Identification of the depot under consideration for the proposed workload.

Item 2 [Date]: Self Explanatory

Item 3 [Solicitation Number]: For Workloads under specific competition RFPs. Not required for initial consolidation studies.

Item 4 [Customer]: Identification of the customer or service who has primary management responsibility for the workload under consideration.

Item 5 [Project Brief]: A brief description of the requested depot maintenance action such as F-4 Programmed Depot Maintenance (PDM) or F-14 Standard Depot Level Maintenance (SDLM).

Item 6 [Customer Quantity]: The number of units of workload being considered. Use only if applicable.

Item 7 [Estimated Hours per Unit]: The number of hours (specify by circling whether Standard or Actual) estimated per unit of production.

Column 8 [Cost Per Hour]: The proposed cost per hour developed in accordance with the rules and procedures contained in other sections of this handbook. Although cost per unit is the basis for evaluation, cost per hour is provided for analytical purposes.

Column 9 [Cost Per Unit]: The proposed cost per unit the Source of Repair (SOR) will charge the customer. Must be developed in accordance with the rules and procedures contained in this handbook. Under competition this will be the bid price per unit.

Column 10 [Total Project Cost]: The total project cost using the information in lines 6 and 7, columns 8 and 9.

CUSTOMER COST

Line 11 [Direct Labor]: The amount of Direct Labor expressed in terms of cost per hour (column 8), cost per unit (column 9), and total project cost (column 10) developed in accordance with Appendix A of this handbook.

Line 12 [Direct Material]: The amount of direct material expressed in terms of cost per hour (column 8), cost per unit (column 9), and total project cost (column 10) developed in accordance with Appendix A of this handbook.

Line 13 [Other Direct]: The amount of other direct cost expressed in terms of cost per hour (column 8), cost per unit (column 9), and total project cost (column 10) developed in accordance with Appendix A of this handbook. Includes contracts, direct travel and per diem or other direct purchased services.

Line 14 [Production Overhead (Indirect)]: The amount of production overhead cost expressed in terms of cost per hour (column 8), cost per unit (column 9), and total project cost (column 10) developed in accordance with Appendix A of this handbook.

Line 15 [General and Administrative Expense (G&A)]: The amount of G&A cost expressed in terms of cost per hour (column 8), cost per unit (column 9), and total project cost (column 10) developed in accordance with Appendix A of this handbook.

Line 16 [Customer Cost]: The sum of lines 11, 12, 13, 14 and 15 in the respective columns 8, 9, and 10. This represents the customer's cost of the proposed workload.

PROPOSED COMPARABILITY ADJUSTMENTS

Line 17 [Engineering]: The amount being subtracted for comparability purposes in accordance with Appendix A of this handbook. This negative adjustment will not exceed the amount included for this expense element in lines 11 through 15.

Line 18 [Supply]: The amount being subtracted for comparability purposes in accordance with Appendix A of this handbook. This negative adjustment will not exceed the amount included for this expense element in lines 11 through 15.

Line 19 [Equipment Depreciation]: The amount being added for comparability purposes in accordance with Appendix A of this handbook.

Line 20 [Base Support Cost]: The amount being subtracted for comparability purposes in accordance with Appendix A of this handbook. This negative adjustment will not exceed the amount included for this expense element in lines 11 through 15.

Line 21 [Unfunded Civilian Retirement]: The amount being added for the cost of the unfunded Civil Service Retirement System (CSRS) liability. See the section on unfunded Civilian Retirement in Appendix A.

Line 22 [Depreciation for MCP Facilities]: The amount being added for the depreciation of facilities constructed with Military Construction Program funds. See Appendix A for public/private competition. Depreciation for the facilities will be for the entire time period for the workload being competed. Need not be included for public/public only competition.

Line 23 [Other Recurring Cost]: The amount, for any recurring non-Industrial Fund costs that develop as a result of the proposed alternative being considered. For example, the increased/decreased cost of Second Destination Transportation (SDT) due to different geographical locations. For competition, these costs will be for the time period being competed.

Line 24 [Other]: The amount being adjusted for comparability purposes in accordance with Appendix A of this handbook (example: surcharge for DLRs for Navy until other services implement - see summary of adjustments on page A3). Each item of adjustment will be separately identified and justified. A negative adjustment will not exceed the amount included for this expense element in lines 11 through 15.

Line 25 [Total Comparability Adjustments]: The sum of amounts on lines 17 through 24 in the respective columns 8, 9, and 10 (may be negative).

Line 26 [Depot Maintenance Comparability Costs]: The sum of the amounts on lines 16 and 25. This amount represents the comparability cost between services for their respective Industrial Funds. Columns 8, 9, and 10 apply.

OTHER DOD NONRECURRING COSTS

Line 27 [Capital Expenditures]: The expenditure of appropriated funds in order to purchase equipment or construct facilities to energize the proposed source.

Line 28 [Transfer/Relocation Expenditures]: The nonrecurring (one time) costs to transfer/relocate the workload under consideration. This includes such costs as training/retraining, equipment packing and transportation, etc. (see pages 13 for explanation).

Line 29 [Changes in Spares]: The cost of spares or expense material due to reduced or extended pipeline times such as longer repair times or reduced transportation flowdays. This includes the cost of establishing inventories, when additional spares or expense material must be obtained.

Line 30 [Other]: For the identification and quantification of other DOD (not covered above) costs necessary to energize the proposed source.

Line 31 [Total Other DOD Nonrecurring Costs]: The sum of lines 27 through 30.

TOTAL ALTERNATIVE COST

Line 32 [Total Alternative Costs]: The total cost to DOD necessary to determine the "best value". Should summarize all costs to DOD necessary for selection of a repair source (Sum of lines 26, and 31).

COMPARABILITY FORMAT INSTRUCTIONS
(Figure 3)

Item 1 [Solicitation Number]: For Workloads under specific competition RFPs. Not required for initial consolidation studies.

Item 2 [Customer]: Identification of the customer or service who has primary management responsibility for the workload under consideration.

Item 3 [Project Brief]: A brief description of the requested depot maintenance action such as F-4 Programmed Depot Maintenance (PDM) or F-14 Standard Depot Level Maintenance (SDLM).

Line A [CURRENT COST]: The entry on this line will include the current total funded cost per unit times the quantity of units under consideration. Entries for this line will be limited to activities that are currently in production for the specific workload under consideration.

Line B [CUSTOMER COSTS]: This entry will include all organic industrial fund costs (Line 16 from Comparability/Bid Proposal Worksheet) required to produce the workload under consideration at the consolidation/bidding site. All direct labor costs, direct material costs, indirect labor and material costs, overhead, general and administrative costs per unit will be included. In order to determine savings that accrue from competition this line will be subtracted from line "A". This will be the cost that the customer will pay to the selected Source of Repair (SOR).

Line C [COMPARABILITY ADJUSTMENTS]: The amount of adjustments required to ensure comparability between the different SORs (line 25 from the Comparability/Bid Proposal Worksheet).

Line D [OTHER DOD NONRECURRING COSTS]: The other nonrecurring (one time) costs incurred by DOD associated with shifting workloads that are funded from sources other than the customer's direct funding to the Source of Repair (SOR). In order to compare the total cost to DOD for the workload under consideration these costs must be quantified (Line 31 from Comparability/Bid Proposal Worksheet).

Line E [TOTAL ALTERNATIVE COST TO DOD]: This line is the sum of the customer cost (B), the comparability adjustments (C), and nonrecurring costs (D). This line reflects the total cost from all funding sources that relate to the workload under consideration. The total on this line will be the cost criteria that drives source selection.

COST COMPARABILITY FORMAT

1. SOLICITATION NUMBER:	2. CUSTOMER:

3. PROJECT BRIEF

COSTS SUMMARY	SOURCES		
	SOURCE OF REPAIR 1	SOURCE OF REPAIR 2	SOURCE OF REPAIR 3
A. CURRENT COSTS			
B. CUSTOMER COSTS			
C. COMPARABILITY ADJUSTMENTS			
D. OTHER DOD NONRECURRING			
E. OTHER RECURRING COSTS			
F. TOTAL ALTERNATIVE COSTS			

Figure 3

OVERRUNS/UNDERRUNS

When the customer changes the specification of work or if during the course of the work unexpected conditions are encountered the performing activity will contact the customer and they will jointly agree on the appropriate action. If the customer agrees that the additional work is necessary, the customer will be required to fund the additional work.

Past performance will be considered when evaluating all offerors.

VERIFICATION AND VALIDATION

All proposals, contracts, or work orders will be subject to audit by service/DOD audit agency. In addition, the actual execution of the work is subject to verification by the customer's engineers and agents.

The performing organization is required to follow generally accepted accounting practices and is required to comply with all regulatory guidance. All cost allocation techniques are to be fair, rational and uniformly applied to all workloads within the depot.

Initially, the service representatives on the cost comparability committee will review the consolidation studies for the lead service commodity groups and certify that the proposals are within the rules and procedures outlined in this handbook.

APPENDIX A
DEFINITIONS

GENERAL

Unless otherwise stated, each of the cost elements represents cost to a DOD Depot Maintenance Industrial Fund.

There are four sections for each cost definition. The first section gives a common definition of each cost element. This is followed by service unique definitions or treatment of the cost element. The last two sections indicate how the cost element should be treated for comparability - both in a formal bid process and when a decision is being made on assignment of workloads to a service. The CUSTOMER/BID section indicates whether the cost element should be included in a services bid or for consolidation decisions. The 'Required Adjustment' section indicates whether any adjustment should be made for either type comparability based on the services accounting system. The cost elements are organized into functional areas as follows:

Functional Area	Pages
Production Support Functions	A-6...A-13
Other Indirect Functions	A-14...A-24
Facility Support Functions	A-25...A-27
Equipment Management Functions	A-28...A-29
Indirect Labor Costs	A-30...A-31
Material Adjustments	A-32...A-33
Depreciation/Amortization	A-34...A-35

Direct costs are defined in Chapter 76 of DOD 7220.9M. There are three categories of direct costs (labor, material, and other). The definitions are as follows:

a. Direct Labor - Work performed solely for the benefit of a single specific job order as provided by engineering estimates. The number of direct labor hours (civilian and military) chargeable to a job order are only those incurred during the period of time that benefits accrue solely to that specific job order. All other labor hours (civilian and Military) shall be recorded as indirect.

b. Direct Material - Material and supplies that can be identified as specifically required for the performance of work as specified by a work authorization document and/or Bill of Material (BOM). A small item of insignificant material may be treated as indirect material even though the item is incorporated as a part of the final product, if this practice is consistently applied from job order to job order. Direct material may either be incorporated as part of the final product or consumed in the maintenance process.

c Other Direct Costs - Purchased services shall be charged as direct costs to the job order that benefits from the services. If only one job order benefits from a contract or purchase, the cost of the contract shall be charged to that job order. If more than one job order benefits from a contract, the cost of the contract shall be prorated to the benefiting job orders based upon estimates or calculations of the benefits received by each job order.

(1) The cost of contracts that supplement capacity or capability for the depot shall be charged to the job orders that use the additional maintenance services.

(2) Travel and per diem expenses including regular labor hours spent in travel shall be charged as other direct costs only if the labor hours worked while traveling are charged as direct labor. If more than a single job order is worked on, the travel and per diem expenses shall be prorated on the basis of the related direct labor. Otherwise, all travel and per diem expenses shall be charged as an indirect expense of the employees cost center.

SUMMARY OF ADJUSTMENTS

For each defined element a determination must be made from the definitions on the need to make adjustments. Remember, adjustments from the bid price will only be made if the specific cost element is included in the service's proposals. Also adjustments for a specific cost may not include the complete cost element but could be only a portion of the element. Review and understand the definitions to be sure as to the need for an adjustment.

The following matrix of identified adjustments has been developed to summarize the results of the committee's efforts. The matrix includes two columns. The first column identifies the adjustments required for a public to private competition and the second column is for public to public competition or comparison.

The coding for each element is as follows:

(-) Indicates that this cost element or some portion of the cost element will be adjusted out of the bid price. Remember, adjustments will only be made if the element is included in the bid. Read the definition to determine which Service(s) any adjustment is appropriate.

(+) Indicates this cost element or some portion of the element will be added to the bid price. The Service that this applies to is indicated in parenthesis.

(Ø) No adjustment required.

SUMMARY OF ADJUSTMENTS MATRIX

Cost Element	Public/Private Bid Adjustment	Public/Public Bid Adjustment	PG. #
Test Pilots	-	Ø	A-8
Supply Functions	-	-	A-8
Engineering - Design Support to Production	-	-	A-9
Commercial Activities (A76)	-	Ø	A-16
Industrial Health Services	+ (A,N,MC)	+ (A,N,MC)	A-17
Central System Design, Development & Maintenance	+ (A)	+ (A)	A-21
Contract Administration	+	Ø	A-24
Mobilization Planning	-	Ø	A-24
Facilities Maintenance and Repair	- (tenant)	- (tenant)	A-27
Motor Pool/Vehicle Maint	Ø	- (A,N)	A-28
PMEL/Calibration	+ (A)	+ (A)	A-28
Unfunded Civilian Retirement	+	Ø	A-31
Military on Active Duty	-	-	A-31
Real Property - MCP	+	Ø	A-34

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INDIRECT COST ELEMENT DEFINITIONS

PRODUCTION SUPPORT FUNCTIONS

FIRST LINE SUPERVISION

COMMON: Supervision level immediately over the direct labor workers. The first line supervisor is designated as an official supervisory position and the labor costs shall be charged as an indirect cost. Crew chiefs', 'snappers', and 'team leaders' are not first line supervisors.

SERVICE UNIQUE: NAVY - Treats as direct costs for some workloads, i.e., F-14 and P3A competition aircraft.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

WORKLOAD PLANNING/SCHEDULING/ESTIMATING/PRODUCTION CONTROL

COMMON: The labor cost associated with the short term and long term functions involving the coordination and execution of current plans and programs, cost estimating, scheduling, posture planning, customer fund administration, workload negotiation, material requirements forecasting, and control production workload.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

MATERIAL HANDLERS/TRANSPORTATION/EQUIPMENT OPERATORS

COMMON: Those labor costs related to general material handling, i.e., those persons supporting numerous direct job orders, that are responsible for checking, processing, moving and distributing material, shall be charged to the overhead expense of the performing shop. This includes material runners, expediters, handlers and equipment operators. Costs for second destination transportation are not included.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

MANAGEMENT OF MATERIALS

COMMON: Includes following functions: requisitioning from supply source, turn-ins to supply, storage of IF material, inventory accountability, issuing from IF inventory, management of inventory levels, research of stock numbers, awaiting parts management, and material receipts inspections. Material receipt inspection is defined as the examination (including testing of supplies and services including, where applicable, raw materials, documents data, components and intermediate supplies) to determine whether the supplies and service conform to the technical requirements.

SERVICE UNIQUE: None ~~ARMY - Material inspection is direct. In addition Army handles management of materials as follows: Stabilized rates/fixed prices for all maintenance customer orders/workload have a factor incorporated to recover supply costs (i.e., receiving, storing, inventorying and issuing of maintenance repair parts). The factor (i.e., supply support to maintenance) is based on a rate per direct labor hour which is assessed to our maintenance customers as a direct other cost. This approach is similar to the service cost center concept employed by the other services. Accordingly, maintenance workload now reflects a true cost to accomplish the supply effort involved with same.~~

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

TOOLS MANAGEMENT

COMMON: Tool management is the labor costs incurred in requisitioning, receiving, stocking, storing, and issuing durable hand and power tools. Also included in this category are the labor costs for general operations of the tool room/crib. The acquisition costs of the tools is chargeable to Expendable tools and equipment.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

TEST PILOTS

COMMON: Labor costs for military and civilian pilots who perform functional test flights for aircraft that were repaired in the depot. With the change of funding military personnel from IF, this is a funded direct expense.

SERVICE UNIQUE: Marines - Do not have costs in this area.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust out of bid for public to private.

SUPPLY FUNCTIONS

COMMON: Non-industrial fund material storage, warehousing, issuing, receiving, inspection, inventory and accounting.

SERVICE UNIQUE: NAVSEA - Performs this function for stock fund managed items and the functions described above are charged to indirect. Shipyards long lead time material; ordnance activities are stock points for stock fund material.

NAVAIR - Reimburses for supply functions.

ARMY Stabilized rates/fixed prices for all maintenance customer orders/workload have a factor incorporated To recover supply costs (i.e., receiving, storing, inventorying, and issuing of maintenance repair parts) The factor (i.e., supply support to maintenance) is based on a rate per direct labor hour which is assessed to our maintenance customers as a direct other cost. This approach is similar to the service cost center concept employed by the other services. Accordingly, maintenance workload now reflects a true cost to accomplish the supply effort involved with same.

CUSTOMER/BID PRICE: Not a depot maintenance cost. If included make adjustment as indicated below.

REQUIRED ADJUSTMENT: Adjust out of bid for both public to public and public to private.

PROGRAMMING COMMON ATE/NC EQUIPMENT

COMMON: Programming effort necessary to develop programs that operate and control ATE and NC equipment. If programming effort can be identified to a specific direct job order, the cost will be direct - otherwise treat as indirect cost.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

WEAPON SYSTEMS ENGINEERING

COMMON: Total engineering support for weapon systems. Includes designing repairs and modifications, configuration management, monitoring reliability data and weapon systems performance, maintaining technical data, and technical support of production. These services are normally considered a customer related cost not Depot Maintenance.

SERVICE UNIQUE: NAVY - In NAVAIR this service is a direct workload.

CUSTOMER/BID PRICE: Not a Depot Maintenance cost.

REQUIRED ADJUSTMENT: No.

ENGINEERING - DESIGN SUPPORT TO PRODUCTION

COMMON: Costs incurred for weapon systems design support to production. For example, problems encountered that are not covered by tech data/manuals. This is an extension of weapon systems engineering as stated above. However, some services separately identify these cost and treat them differently. Weapon system engineering including design engineering to production are those engineering activities and their related costs up to and including the development and documentation of design repairs, maintenance procedures, technical orders, and/or engineering instructions.

SERVICE UNIQUE: NAVAIR - Indirect Funded Cost

All Others - Unfunded Cost

CUSTOMER/BID PRICE: Not a depot maintenance cost. If included adjustment as indicated below.

REQUIRED ADJUSTMENT: Adjust out of bid for both public to public and public to private.

PRODUCTION ENGINEERING

COMMON: Production engineering costs are those costs incurred in the application of industrial engineering principles and techniques relating to the propriety of technical data packages. Also included are functions for overhaul procedures, shop routing, process sequences, work flows, changes to technical data and inspection procedures, and the development of overhaul standards including analysis and refinement of production methods.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

INDIRECT PRODUCTION MATERIAL/OPERATING SUPPLIES

COMMON: Materials used in the production of an end product or services which can not be charged accurately and economically directly to a job order due to: (i) the smallness of the quantity used/required, and (ii) the difficulty experienced in measuring consumption of same. Examples are plating, acids, impregnating substances, gases, welding rods, paint, nuts, bolts, pre-expended bins, etc.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include

REQUIRED ADJUSTMENT: No.

CETS

COMMON: Engineering and technical services performed by DoD contractors. Contractor engineering and technical services consist of the following:

a. Contractor Plant Services. Engineering and technical services provided to DoD personnel by a manufacturer of weapon systems, equipment, or components. These services are provided in the manufacturer's facilities by engineers and technicians employed by the manufacturer.

b. Contractor Field Services. Engineering and technical services provided to DoD personnel by technically qualified DoD contractor representatives. These services include information, instruction and training, and hands-on training incidental to other forms of training provided by contract representatives.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

PRODUCTION TESTING (POL)

COMMON: Testing POL is all petroleum products utilized in depot maintenance support of aircraft and engines.

SERVICE UNIQUE: NAVY - Treats as direct cost.

AIR FORCE and ARMY - Treat as indirect costs.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

BACKROBBING

COMMON: Backrobbing is the labor cost for taking of an assembly, subassembly, component or part from one item that has been inducted for maintenance for use on another item inducted for maintenance with the intention of replacement at a later time. Installation of the backrobbed component into the benefiting end item is charged to the benefiting job order.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

CANNIBALIZATION

COMMON: Cannibalization is the labor costs for taking of an assembly, subassembly, component or part from an item that has not been inducted for maintenance. Normally restricted to salvage/condemned items.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No

DEFECTIVE WORK, REWORK AND SPOILAGE

COMMON: Defective work, rework, and spoilage is the effort (i.e., material and labor) needed to remedy or correct imperfections arising from normal production and bring to standard specifications. Included also is the cost associated with redoing 'guaranteed' work and the cost of re-inspecting components and assemblies. Costs associated with defective work and spoilage will be charged to the benefiting job order as a direct cost when the amount is within the range of expected norms. However, excessive cost not related to the job order or costs to correct major deficiencies relative to defective work and spoilage will be charged as an indirect maintenance overhead expense.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

QUALITY MANAGEMENT

COMMON: Quality management is defined as the development, implementation, and maintenance of generic quality procedures and general document control. Also included are those functions that provide quality requirements and assessment criteria, quality systems, quality management, engineering and technical control. Involves the development and application of statistical process control techniques to continually improve processes and determine process capabilities.

SERVICE UNIQUE: None

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

TESTING/INSPECTIONS/VERIFICATION

COMMON: In-process inspection of maintenance production for early detection of deficiencies in the product or service and final inspection and acceptance testing. Additional testing and inspection is performed through use of oil analysis, destructive testing, accident investigation and chemical testing.

SERVICE UNIQUE: ARMY - Direct - Performance of oil analysis, accident investigation, metallurgical, inprocess and final inspection, final testing and chemical testing for an outside customer. Indirect - When these functions are performed for the benefit of the depot. (Example: Chemical test for plating tank solutions.)

MARINES - In-process inspection (sampling) is indirect. Final inspection is direct.

NAVSEA - Test design and evaluation related to customer work, and all inspection (initial, final, or operational during the productive process) is coded direct, non-customer work is indirect

NAVAIR & AIR FORCE - Inspections performed by artisans/mechanics is direct. Those performed by personnel from quality organizations are indirect.

CUSTOMER/BID PRICE: Include

REQUIRED ADJUSTMENT: No.

QDR/MDR/ADR

COMMON: The labor cost for a customer identified defect or nonconforming condition which limits or prohibits the item from fulfilling its intended purpose. Included are deficiencies in material, manufacturing, operations and workmanship. Includes the investigation and resolution of a customer complaint.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

OTHER INDIRECT FUNCTIONS

COMPTROLLER SERVICES

Introduction:

Includes financial analysis, cost accounting, budget, pay and travel, and vendor payment functions. Each of these functions is included below All the services treat these cost as indirect; however the method in which they obtain the services are different.

NAVY - Uses in-house IF personnel except for travel, vendor payments, and some pay functions

ARMY IF personnel provide services.

MARINES All performed by others and reimbursed except budget function which is performed in-house.

AIR FORCE - Performs financial analysis and budget in-house. Other functions are performed by others on a reimbursement bases.

ACCOUNTING

COMMON: Includes financial analysis and cost accounting. Financial analysis is costs associated with monitoring the financial health of the industrial fund operation including the preparation of financial reports, briefings and analysis. Cost accounting includes all costs associated with the collection and classification of financial accounting data in accordance with regulatory guidance.

SERVICE UNIQUE: None

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

BUDGET

COMMON: All costs associated with the preparation and analysis of industrial fund budgets. Examples of workload involved are: stabilized rate development, overhead rate development, and budget execution reviews.

SERVICE UNIQUE· None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

FINANCE

COMMON: Includes the cost of administering the payroll and travel of industrial fund employees and the cost of industrial fund vendor payments.

SERVICE UNIQUE: NAVY - Travel & vendor payments unfunded. Aviation - Payroll unfunded at 3 locations.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

OTHER INDIRECT COSTS

COMMON: Supervision, administration, secretarial and clerical costs are those costs related to the management and administrative support of industrial fund operations. Examples of functions included in this category are military (other than direct) secretaries, clerks, staff support, administrative assistants, all supervisors and other functions not defined elsewhere. Additionally, administrative efforts involved with bond drives, the Combined Federal Campaign (CFC), management improvement programs (i.e., beneficial suggestions, cost reduction, TQM, etc), and other special observances (i.e., Martin Luther King Program, Black History Month, etc) are included.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

TRAINING/TUITION - IF EMPLOYEES

COMMON: Cost of tuition, fees, books, etc. for IF employees in formal training status. Excludes On-Job-Training (OJT) and when specific training is required for unique jobs or functions. Does not include travel costs associated with training. All travel costs are chargeable to travel.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

COMMERCIAL ACTIVITIES (A76)

COMMON: Cost of performing A76 studies.

SERVICE UNIQUE: MARINES - Unfunded

AIR FORCE - Portion accomplished by cost analysis function of comptroller is unfunded.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust out for public to private.

AIRCRAFT OPERATIONS

COMMON: Aircraft or 'air field operations' are those costs associated with support functions for local and transient aircraft to include flight clearance authority, weather service, crane and rescue facilities, flight planning facilities, aircraft servicing operations, notice to airmen service and operations security. Also includes coordination with flight service stations, air route traffic control centers and approach control units. Costs associated with this element are not financed with industrial fund resources.

SERVICE UNIQUE: NAVY - Reimburses based on portion of total flights performed.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

COMMUNICATIONS

COMMON: Includes telephone services (local, long distance), equipment (leased/owned), installation and relocation of equipment, and maintenance/service of equipment. Funded as indirect. Message service and AUTOVON is unfunded, however personnel are funded.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

DATA AUTOMATION

COMMON: Includes the administration and operation of the information management function: to include information architecture plans, system integration, supervision of related operational activities. Also included is the analysis, design, programming operations and maintenance of depot industrial fund management information systems along with associated personnel, supplies, equipment and all other costs in support of base operations data processing facilities including the costs of transmitting data to a centralized facility.

SERVICE UNIQUE: None

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

MAINTENANCE - ADPE

COMMON: Cost of preventive maintenance and repair of industrial fund owned ADPE.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

INDUSTRIAL HEALTH SERVICES

COMMON: Health services costs are those costs incurred in treating civilian employees. Includes those who are injured in the course of their duties, sick during duty hours, return from extended sick leave, and physical exams to determine fitness for duty - including exams by private doctors.

SERVICE UNIQUE: AIR FORCE - Funded.

NAVY - Unfunded except fitness for duty exams.

ARMY - Unfunded.

MARINES - Unfunded.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust in for Navy, Army, and Marines for public to public and public to private.

MAIL DISTRIBUTION

COMMON: Mailroom activities include postal service charges for official correspondence/mail, postage stamps, meter charges, licenses, etc. Mailroom service includes those costs associated with the pickup and delivery of mail and FAX services.

SERVICE UNIQUE: MARINES - Funds Federal Express postage and FAX. Remainder unfunded.

AIR FORCE - Postage unfunded.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

CIVILIAN PERSONNEL MANAGEMENT

COMMON: Civilian personnel management includes costs associated with processing civilian personnel actions, employees benefits programs, civilian personnel records, recruitment and placement policy, planning and accomplishing reductions in force, reorganizations, and transfers of function, position and pay management, labor management relations programs, and training administration.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

MILITARY PERSONNEL MANAGEMENT

COMMON: Military personnel management includes costs associated with processing military personnel actions, military benefits programs, military personnel records, military pay, and training administration. Unfunded by all.

SERVICE UNIQUE: None

CUSTOMER/BID PRICE: Do not include

REQUIRED ADJUSTMENT: No.

SAFETY

COMMON: Safety costs are those costs incurred in the support of safety activities to include assigned civilian personnel salaries and benefits, associated training, safety supplies (i.e., goggles, shoes, earplugs, boots, and hard hats) and other materials used in the promotion of the safety program. Also included are costs associated with accomplishing environmental checks (i.e. air, noise, asbestos). Included costs associated with safety equipment which falls within the realm of the industrial fund expense criteria.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

PROCUREMENT

COMMON: Procurement is purchasing and contracting for supplies, services and minor construction, small business activities, imprest fund, contracting costs and price analysis, assisting with performance work statements, administration of contracts and purchases, advance acquisition planning, and the small and disadvantaged business programs. Any procurement actions initiated by inventory control points are considered outside the scope of consideration for cost comparability purposes.

SERVICE UNIQUE: NAVY - NADEP procurement efforts are unfunded. The Naval Supply Center and Naval Regional Contracting Office provides the procurement services free. At some NAVSEA NIF activities, procurement actions in excess of $200,000 ; $500,000; or $1,000,000 are serviced by central procurement offices - Navy Regional Contracting Office (example).

AIR FORCE - Local purchase is unfunded, Equipment purchases (ACP) is reimbursed.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

PUBLIC AFFAIRS

COMMON: Public affairs costs are those costs incurred in the planning, supervising and conducting of programs associated with the preparation and release of information through various informational media to internal and external audiences. Also included are those costs incurred that are associated with all local news media outlets and the civilian community.

SERVICE UNIQUE: MARINES - Unfunded.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

AUDIO VISUAL SERVICES

COMMON: Cost associated with issuing, maintaining, and procuring audio visual equipment, making video presentations, maintaining the film library and taking official photographs and slides.

SERVICE UNIQUE: AIR FORCE - Base audio visual office costs are unfunded. Industrial Fund maintains own contract for this service.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

PRINTING AND REPRODUCTION

COMMON: Printing and reproduction costs are all costs incurred by the industrial fund for printing, reproduction, and publishing services needed to accomplish the industrial fund requirements. Excluded as a cost of printing and reproduction is the cost associated with the original copy of automatic data processing output products which is properly costed to automatic data processing operations.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

CENTRAL SYSTEM DESIGN, DEVELOPMENT AND MAINTENANCE

COMMON: Central MIS design includes cost incurred in the development of depot maintenance computer systems and programs. Systems design accomplished for service-wide data systems are unfunded.

SERVICE UNIQUE: Army is unfunded.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust in for Army.

HAZARDOUS WASTE MANAGEMENT

COMMON: Management and disposal of hazardous waste resulting from the production process includes labor, material and contractual costs for cleaning air, water, ground, and ground water. Hazardous waste management includes environmental engineering functions, such as, control of hazardous waste, design of future buildings and equipment that reduces generation of hazardous waste and ensures compliance with federal, state, and local environmental regulations.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

EQUAL EMPLOYMENT OPPORTUNITY

COMMON: Equal employment opportunity costs are those costs incurred to plan and direct the EEO initiative. Included therein is education and training programs, the Affirmative Action program, the discrimination complaint system and other designated special emphasis programs. Also included is labor cost of personnel while participating in EEO sponsored programs and counseling sessions.

SERVICE UNIQUE: MARINES - unfunded

AIR FORCE - Base EEO office is unfunded whereas IF employees time spent in counseling is funded. IF maintain own EEO office.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

INTERNAL REVIEW

COMMON: All costs incurred in internal review functions including review of financial operations and systems, coordination of external audits/reviews, and monitoring follow-up on internal and external audits/reviews actions and recommendations. Other functional areas reviewed are to determine submarginal performance in diverse functional areas to improve shop performance, goals, comprehensive investigation, evaluation of trends and variances.

SERVICE UNIQUE: MARINES - All unfunded.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

TECH MANUAL LIBRARY

COMMON: The tech manual library is the repository for all technical data, including books, manuals, blueprints, slides, etc., relating to mission workload performed by the depot. Includes all cost incurred in the operation of the technical library Does not include costs associated with Weapon System Engineering or any other non-IF function.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include

REQUIRED ADJUSTMENT: No

LEGAL

COMMON: Legal costs are those costs incurred in providing legal support for the administration and operation of industrial fund activity. Included therein are legal opinions involving pre and post procurement awards, fiscal matters, environmental matters, labor matters, and criminal investigations. Also, included is the preparation and adjudication of claims against the government.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

OFFICE SUPPLIES

COMMON: Office supplies are defined as those materials such as tablets, pens, pencils, calculator tapes, staplers and other similar items required to sustain production and indirect maintenance operations.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

TRAVEL COSTS

COMMON: Those costs incurred by industrial fund employees (i.e., transportation, per diem, fees, etc.) incurred in the course of TDY and travel for training. Does not include labor costs of employee while in a travel status.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

PCS

COMMON: PCS is all entitlements due an industrial fund employee for a PCS authorized per the joint travel regulations.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

OVER/UNDER APPLIED OVERHEAD ADJUSTMENTS

COMMON: Applied overhead adjustments are made at year end to bring into balance the amount of overhead applied vice actual overhead costs. The purpose for the adjustment is to achieve equality in costs for incurred overhead. The delta is not included in product cost because it is maintained at the General Ledger level only.

SERVICE UNIQUE: AIR FORCE - Does not use.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

CONTRACT ADMINISTRATION

COMMON: Represents the costs (labor, material and associated overhead) incurred by government entities for administering contracts awarded to public/private concerns to ensure specifications/requirements are fulfilled. These costs should be accumulated regardless of the government source of funding.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Not included.

REQUIRED ADJUSTMENT: Add the associated costs to both the private and public bid. No adjustment for public to public competition.

MOBILIZATION PLANNING

COMMON: The costs associated with development and testing of mobilization support provided by depot maintenance during war activation period,

SERVICE UNIQUE: None

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust out for public to private.

FACILITY SUPPORT FUNCTIONS

FUELS

COMMON: Fuels are all petroleum products and other fuel types used to support the installation with the exception of those fuels used for aviation and facilities. Examples are leaded and unleaded gasoline, motor oil, lubricants, kerosene, compressed gases, etc.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

FIRE PROTECTION

COMMON: Includes labor cost for fire prevention, inspection, protection and instruction by fire fighting personnel in support of the Industrial Fund. Also, included is performance of structural and crash fire fighting services.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

JANITORIAL/CUSTODIAL

COMMON: Includes all costs incurred in the performance of janitorial services for all IF areas including production. Excludes end-of-shift clean-up.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

SECURITY

COMMON: Includes all cost incurred for security received, to include daily protection of personnel, equipment, material, and overall administrative responsibility for the physical security, loss prevention program, and the monitoring of the information security program. Includes personnel badges, vehicle decals, and traffic control.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

UTILITIES

COMMON: Includes the cost of water, sewage, steam, refuse/garbage, electricity, air conditioning, gas (including natural), compressed air, fuels (for facilities) and utility maintenance used by the IF. Also includes costs for utility operations provided by the host or other outside sources.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

SHOP/OFFICE REARRANGEMENT

COMMON: Includes all costs incurred due to the rearrangement of the shop/office

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include

REQUIRED ADJUSTMENT: No.

FACILITIES MAINTENANCE AND REPAIR

COMMON: Includes all costs for planning, designing, and recurring day-to-day, periodic, or scheduled work required to preserve or restore a facility to such condition that it may effectively be used for its designed purpose. Includes work undertaken to prevent damage to a facility which otherwise may be more costly to restore. Includes ground maintenance cost for care of roads, streets, walks, parking areas, shoulders, drainage systems, and lawns.

SERVICE UNIQUE: AIR FORCE - Pay only for pavements and real property which are for the exclusive use of industrial fund entities.

MARINES - Do not pay for common roads.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust for portion which is used by tenant activities.

EQUIPMENT MANAGEMENT FUNCTIONS

MAINTENANCE - PRODUCTION EQUIPMENT

COMMON: Cost of preventive maintenance and repair of production equipment. For example, presses, lathes, test equipment, ground support equipment, grinding machines, milling machines, etc.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

MOTOR POOL/VEHICLE MAINTENANCE

COMMON: Motor pool services includes all costs associated with the operation of and operating/organizational maintenance of the motor pool. Includes cost of preventive maintenance and repair of vehicles. Examples include lifts, forklifts, tow bars, tractors, trains, trucks, fire equipment, cranes, etc.

SERVICE UNIQUE: AIR FORCE - No payment for cost of fire equipment.

MARINES - No payment for cost of fire equipment, motor pool costs unfunded.

CUSTOMER/BID PRICE: Include

REQUIRED ADJUSTMENT: Adjust public to public for amounts Army/NAVSEA have in base operating support.

PMEL/CALIBRATION

COMMON: Includes cost for calibration of equipment, support of standards, etc.

SERVICE UNIQUE: ARMY - Unfunded. Calibration services provided to all Army Industrial Fund depots by employees of the test measurement and diagnostic activity based in Huntsville Alabama are provided without charge to the industrial fund.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust in for Army.

MAINTENANCE - OTHER EQUIPMENT

COMMON: Includes the costs of preventive maintenance and repair for all other equipment (for example - office equipment and furniture).

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

EQUIPMENT RENTAL

COMMON: Includes Costs incurred by the industrial fund for rental of equipment.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

CAPITAL EQUIPMENT PLANNING

COMMON: Capital equipment planning is the labor cost to develop and plan for organizational modernization and to develop long range plans for tooling and capital equipment.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

EXPENDABLE TOOLS AND EQUIPMENT

COMMON: Expendable tools and equipment includes the acquisition cost of office equipment, office furniture, and hand tools such as drills, saws, electric screwdrivers, and other similar items required to accomplish the maintenance function. Expense tools and equipment when the cost is less than the industrial fund capitalization limit.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

INDIRECT LABOR COSTS

NONDIRECT TIME OF DIRECT EMPLOYEES

COMMON: Includes the labor cost for time spent by direct employees on work delays, union activities, safety meetings, training, clean-up, welfare drives, going to dispensary, personnel matters, fire evacuation, intransit time, grievances and appeals, traumatic injury, severe weather, power loss, and light duty

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

ACCELERATION FACTORS

COMMON: Acceleration factors are added to employee pay rates to cover the cost of leave (annual, sick, holiday, and other) and fringe benefits (retirement, insurance, and health). Treatment as direct or indirect cost will be in accordance with how the employee's time is charged.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

OVERTIME/HOLIDAY PREMIUM

COMMON: Represents the premium portions of overtime paid to employees. In general, these costs are treated as indirect.

SERVICE UNIQUE: NAVY - Treats overtime premium as direct cost when worker is performing direct work.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

CASH AWARDS

COMMON: Includes awards given to civilian employees as a result of the appraisal process, suggestions, etc.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

END OF YEAR ACCELERATION ADJUSTMENTS

COMMON: Adjustments are made to adjust labor acceleration factors to actual expenses.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

WORKMENS COMPENSATION

COMMON: Includes cost incurred for workmen's compensation. Workmen's compensation starts 45 days after the employee injury.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

UNFUNDED CIVILIAN RETIREMENT

COMMON: Represents the costs associated with the Civil Service Retirement System (does not include Federal Employee Retirement System) for civilian retirement which are not funded by DOD. The unfunded cost percentage is published annually by the Office of Personnel Management (OPM).

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Not included.

REQUIRED ADJUSTMENT: Add the associated value to all DOD activities which are bidding on a public to private competition. No adjustment required for public to public.

MILITARY

COMMON: Military time spent by active duty personnel performing functions other than Depot Maintenance related functions (Military training, rifle range, physical fitness training, special projects assignments, parades, Armed Forces Day, and other non-maintenance duty assignments). Excluded from this category are civilian employees on military leave (See acceleration factor definition).

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: Adjust out of bid for both public to public and public to private.

MATERIAL ADJUSTMENTS

FUND CODE CHANGES

COMMON: Fund code changes are those changes in material status from unfunded to funded and vice versa.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

INVENTORY ADJUSTMENTS

COMMON: Inventory adjustments are those adjustments made when on hand balances do not agree with inventory, records, intransit material adjustments or other material adjustments.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

DISALLOWED MATERIAL RETURNS

COMMON: Disallowed material returns and backorder cancellations are defined as those materials and supplies ordered/prepositioned for ongoing maintenance programs for which the work requirement for same no longer exists. When the material is returned to supply or the backorder is cancelled, no credit is obtained for the return or cancellation. Disallowed material returns and backorder cancellations will be credited to the job order for which the requirement originally existed. If the original job order is closed or is not identifiable then the value of subject material will be charged as an indirect maintenance overhead expense.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include

REQUIRED ADJUSTMENT: No.

LOSS ON MATERIAL SENT TO DISPOSAL

COMMON: Loss on excess material sent to disposal is that material that has been declared as excess to the depots needs which has been returned to the supply system for appropriate disposition instructions. Costs associated will be charged as an indirect maintenance overhead expense unless it is determined that the customer changed specifications on the original order in which case the cost will be charged to a separate job order for reimbursement from the original customer.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

STANDARD PRICE REVISION

COMMON: Standard price revisions are defined as those adjustments required to bring depot maintenance material and supplies inventories in line with current standard catalog prices.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

DEPRECIATION/AMORTIZATION

REAL PROPERTY MAINTENANCE

COMMON: Amortization of real property maintenance is the spreading of real property maintenance project costs over more than one year.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include

REQUIRED ADJUSTMENT: No.

REAL PROPERTY - ACP

COMMON: Depreciation/amortization of minor construction is the cost charged over the useful life of the minor construction projects.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

REAL PROPERTY - MCP

COMMON: Depreciation/amortization of MCP is defined as the costs charged over the useful life of the major construction project. It is an unfunded cost of operations.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Do not include.

REQUIRED ADJUSTMENT: Adjust in for all bidders under public vs private competition. No adjustment of public to public.

EQUIPMENT

COMMON: Depreciation of IF owned (funded) and equipment owned by other (unfunded) is the acquisition costs of the equipment charged over its useful life. Useful life is different between the services.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

ADP MANAGEMENT SYSTEMS

COMMON: Amortization of management systems is the cost of software or management information design costs spread over its useful life.

SERVICE UNIQUE: None.

CUSTOMER/BID PRICE: Include.

REQUIRED ADJUSTMENT: No.

APPENDIX B

REFERENCES

DOD 7220.9M	Department of Defense Accounting Manual
DOD 7410.4R	Industrial Fund Policy
Title 10	United States Code, Section 2208
DMRD 908/909	Defense Management Review (DMR)
30 Jun '90	Under Secretary for Logistics Memo 'Strengthening Depot Maintenance Activities'
DODD 5128.32	Defense Depot Maintenance Council Charter Nov. 7, 1990
8 Aug '90	Defense Depot Maintenance Council Meeting Minutes, July 24, 1990
	Federal Acquisition Regulation (FAR)

APPENDIX C
SYSTEMS

AIR FORCE

Project Order Control System (G004B)
Depot Maintenance Budget and Mgt Cost System (G035A)
Maintenance Labor Distribution and Cost System (G037G)
Base Level General Accounting Finance System (H069)
Depot Maintenance Production Cost System (G072A)
Contract DM Production/Cost System (G072D)

ARMY

Standard Industrial Fund System
Cost by PCN (B51 M01)
Cost by Procurement Request Order Number (B51 W05)
Cost by Work Center (B51 M02)
Cost by Army Management Structure (B51 M36)

MARINE CORPS

Depot Maintenance Management System (DMMS)

NAVY

SYSMIS FA Series Reports
NOMIS Customer Order File
NIFMS Navy Air Industrial Financial Mgt System

APPENDIX D
COST COMPARABILITY COMMITTEE MEMBERSHIP

NAME	OFFICE	DSN NO.
JOHN STALLINGS (CHAIR)	HQ AFLC/LGP	787-4760
JOHN FARGHER (NAVY REP)	NADEP CHERRY POINT CD 46	582-7600
ABNER J. MORRIS (MARINE REP)	MARINE CORPS ALBANY CD 88	567-6801
JIM MCGLONE (ARMY REP)	HQ AMC AMCRM-FPA	284-9277
DOUGLAS B. WOOD	HQ AFLC/LGPW	787-5969
CAPT. DON MARKEL, USAF	HQ AFLC/FMC	787-3920
SHELIA POLLARD	OC ALC/LAMF	336-2428
PAT DWYER	SM ALC/FM-1	633-1438
HENRY BEZOLD	NAFC CODE 51	225-4342
BOB COOK	NADEP NORFORK CD 220	564-8421
MIKE BUCHKO	NAVCOMPT CODE NAFC-51	225-0947
TOM WALLACE	NAVSEA SEA-015	332-3074
CAPT. KALAS, USN	NAVSEA SEA-07	332-4088
GORDON WELLS	AFLC/FMB	787-4254
JEFF GREENWOOD	HQ DESCOM AMSDS-RM-FP	570-9145
KEN ELLIS	JDMAG/MAU	986-8261
GEORGE FALLDINE	WR ALC/LY	468-5959
WAYNE CHAIN	SA-ALC/FM	945-4408
JOHN R. GOLDSTON	SDSCC-R	861-2271
TRENT BLALOCK	MCLB ALBANY	567-5376
DON MICKE	NADEP JACKSONVILLE CD 222	942-2728

APPENDIX E
ACRONYMS

ACP	Asset Capitalization Program
ADPE	Automated Data Processing Equipment
ADR	Aircraft Deficiency Report
ATE	Automated Test Equipment
CAS	Cost Accounting Standards
CETS	Contractor Engineering and Technical Services
CFC	Combined Federal Campaign
DLR	Depot Level Reparable
DMRD	Defense Management Review Decision
DOD	Department of Defense
EEO	Equal Employment Opportunity
FAR	Federal Acquisition Regulations
G&A	General and Administrative
IF	Industrial Fund
MCP	Military Construction Program
MDR	Material Deficiency Report
NC	Numerical Control
OJT	On-the-Job Training
PCN	Program Control Number
PCS	Permanent Change of Station
PMEL	Precision Measurement Evaluation Lab
POL	Petroleum, Oil, and Lubricants
QDR	Quality Deficiency Report
RFP	Request for Proposal
RIF	Reduction-in-Force
SDT	Second Destination Transportation
SIOH	Supervision, Inspection and Overhead
SDLM	Standard Depot Level Maintenance
SOR	Source of Repair
SOW	Statement of Work
TQM	Total Quality Management

DEFENSE DEPOT MAINTENANCE COUNCIL

CORPORATE BUSINESS PLAN FISCAL YEARS 1992-1997

Summary of changes to DDMC CBP through 10 Feb 93

Page	
Cover	Revised to reflect no date.
iii - viii	Table of Contents: Revised to reflect end product.
ix	Added ($ in Millions) above the projected savings table
ix	Executive Summary: Changed NAVSEA projected Savings to reflect current savings adjustments to NAVSEA near-term savings; accordingly revised near-term savings projection amount in text--new total is $3,133.3M (as of November 1992).
ix - x	Executive Summary: Table and text revised to reflect different NAVSEA and Marine Corps savings levels (as of February 1993).
9	Table 1-3: NAVAIR revised Depot Maintenance Personnel Levels (as of December 1992).
11	Table 1-4: changed DLH (000) to (DLH 000).
14	Table 1-8: Revised NAVSEA savings targets included in the table (as of November 1992).
14	Table 1-8: Revised to reflect different NAVSEA savings targets (as of February 1993).
15	Table 1-9: Revised NAVSEA savings projections included in the table (as of November 1992).
15	Table 1-9: Revised to reflect NAVSEA and Marine Corps savings changes, different NAVSEA savings targets, and recomputed variances (as of February 1993).
16	Table 1-10: Revised NAVSEA savings projections included in the table (as of November 1992).
16	Table 1-10: Revised to reflect NAVSEA and Marine Corps savings changes (as of February 1993).
25	Table 3-1: Revised NAVSEA savings projections included in the table (as of November 1992).

Summary of changes to DDMC CBP through 10 Feb 93 (cont.)

Page	
25	Table 3-1: Revised to reflect NAVSEA and Marine Corps savings changes, different NAVSEA savings targets, and recomputed variances (as of February 1993).
28	6th line from top of page: Added "ground support" in front of Gas Turbine Engines.
37 - 39	Table 3-9: Deleted. **All subsequent tables in Chapter 3 are accordingly renumbered and the document repaginated.** Deleted references in text to Table 3-9.
40	Section 3.4.1, next to last sentence of first paragraph: Revised to show current NAVSEA near-term savings projection ($975M vice $1.1B) as of November 1992). Now page 38.
40	Section 3.4.1, next to last sentence of first paragraph: Revised to show current NAVSEA near-term savings projection ($1.1B vice $975M) (as of February 1993). Now page 38.
41	Table 3-10: Revised NAVSEA near-term savings projections included in the table (as of November 1992). Now page 39.
41	Table 3-10: Relabeled to 3-9; page number changed to 39; and revised to reflect NAVSEA savings changes, different NAVSEA savings targets, and recomputed variances (as of February 1993).
44	Third full paragraph, next to last sentence: Changed to read "Withdrawal of other SGE functions was completed by August 1992." Now page 42.
45	Section 3.5.2.1, first paragraph: Added the word "transfer" after both uses of "workload." Now page 43.
45	Section 3.5.2.1, third paragraph: Changed OC-ALC to OO-ALC for the F-4 airframe workload transfer. Now page 43.
48	Paragraph 3.6: Page number changed to 46, last sentence on page deleted to reflect Marine Corps savings changes.
49	Table 3-13: Relabeled to Table 3-12; page number changed to 47; and revised to reflect Marine Corps savings changes and recomputed variances (as of February 1993).

Summary of changes to DDMC CBP through 10 Feb 93 (cont.)

Page	
50	Paragraphs 3.6.2.1 and 3.6.2.2: Page number changed to 48, and revised to reflect Marine Corps savings changes.
53	Paragraph 4.2: Page number changed to 51, revised to reflect revised interserviceing savings total, Table 4-1 revised to reflect Marine Corps interservicing savings changes.
55	Section 4.3.2: first paragraph, fifth sentence: Now shows DMI Program Workload at seven percent with a one percent increase from FY90. Now page 53.
56	Chart 4-2: Revised to show 7 percent DMI workload for FY91. Now page 54.
57	Section 5.1, second paragraph: Included "private-private" as a basis for competition. Now page 55.
57-58	Section 5.1, second paragraph, first, second, and third subsection: Revised the discussions of legislation governing competition; noting the new language and sections of the FY93 National Defense Authorization and Appropriation Acts. Now pages 55-56.
57	Table 5-1: Page number changed to 55, revised to reflect Marine Corps competition savings changes.
58	First full paragraph: Beginning with the second sentence, revised to reflect the past tense. Now page 56.
62	Table 5-4: Under Army competitions; clarified AH/UH Airframes as AH-1/UH-1 Airframes. Now page 60.
62	Table 5-4: Revised NAVSEA FY93 competition workload value to $218.6M vice $333.0M. Now page 60.
62	Table 5-4: Further revised Army FY93 Competition Candidates. Now page 60.
63	Table 5-4: Page number changed to 61, revised to reflect Marine Corps FY93 competition project of 5-Ton Series Trucks.

Summary of changes to DDMC CBP through 10 Feb 93 (cont.)

Page	
67	Table 6-2: Corrected typo on FY94 workload; it now reads 3,114 vice 3,144. Now page 65.
72	Table 6-10: Corrected capacity utilization rate for FY91; it now reads 112% vice 109%. Now page 70.
76	Table 6-18: Corrected typo on drydock utilization rate for FY92; it now reads 64% vice 84%. Now page 74.
81	Table 6-34: Revised Competition Risk data. Now page 79.
81	Text under Table 6-34: Added B-52H in the SOR list, per AF comments from OC-ALC. Now page 79.
81	Table 6-35: Revised Competition Risk data. Now page 79.
82	Table 6-36: Revised Competition Risk data. Now page 80.
82	Text under Table 6-36: Added F119 aircraft engine and deleted F103 aircraft engine, per input from SA-ALC. Now page 80.
83	Table 6-38: Revised Competition Risk data. Now page 81.
84	Table 6-39: For AGMC, revised FY92-FY97 Capacity and Utilization indexes and added Competition Risk data for FY94-FY97. Now page 82.
84	Section 6.3.6: Last sentence of paragraph deleted. Now page 82.
84	Table 6-40: Marine Corps Logistics Base, Albany Capacity Index. revised for FY92-FY97; it was is 1,201.0 for each year (as of November 1992). Now page 82.
84	Table 6-40: Further revised Marine Corps revised Capacity Index for MCLBA (as of February 1993). Now page 82.
101	Appendix D: NAVAIR revised Depot Maintenance Personnel Levels (Service Summary and NADEP Alameda). Now page 99.
102	Appendix D: NAVAIR revised Depot Maintenance Personnel Levels (NADEP Norfolk). Now page 100.

FOREWORD

As we transition to "Depot Maintenance 1995 and Beyond", we envision depots operating in a business-like, cost effective manner while maintaining a balance between military and economic objectives. The depots will be smaller, with more robust and specialized operations. They will be sized to the operating forces' technology and workload requirements, unnecessary redundant capabilities will be eliminated, and capacity utilization will be optimized. The Services' technical excellence will be competitive with the best that private industry has to offer, and the depots will compete against each other and private industry whenever it makes sense to do so. Under the guidance, direction, and sponsorship of the Defense Depot Maintenance Council implemented through the Joint Policy Coordinating Group on Depot Maintenance, the Services will achieve a mutually supportive, cost effective, and superior infrastructure which meets the needs of individual and unique Service missions and provides best value to the nation. This and future editions of the Defense Depot Maintenance Council Corporate Business Plan will lead us along this well defined path towards our goal.

The FY92-FY97 Defense Depot Maintenance Council Corporate Business Plan updates the joint Service strategy established in the Defense Depot Maintenance Corporate Business Plan FY91-FY95, December 1991, for management of the Department of Defense (DOD) depot maintenance industrial base. In building upon the first edition of the plan, this edition illustrates the continued resolve of the joint depot maintenance community to increase efficiency and productivity while preserving the capability to ensure the weapon system and equipment readiness of our fighting forces, and while streamlining, restructuring, and consolidating functions.

This document reviews progress made toward achieving this vital objective during FY91 and provides the current strategy for continuing the effort. The basic plan laid out the Services' strategy for decreasing the depot maintenance budget by a cumulative total of $3.9B during the period FY91-FY95. In accordance with Defense Management Report Decision 908C Consolidating Depot Maintenance, 12 January 1991, this edition describes how this effort will be extended through FY97 in order to achieve a cumulative total savings of approximately $6.3B during the period FY91-FY97. It reviews individual Service strategies, notes changes in strategy from the basic plan, addresses progress of implementation, and specifies savings achieved through 30 September 1991. Future annual editions will provide similar information.

The evolution of the organic depot maintenance infrastructure into a more streamlined, efficient, and competitive industrial base for the next century has begun. This effort has been marked by a joint Service determination to address complex issues, make hard choices, and take prompt action to implement decisions.

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EXECUTIVE SUMMARY

This edition of the Defense Depot Maintenance Council Corporate Business Plan (DDMC CBP) describes the joint Service strategy for managing the organic depot maintenance industrial base during the remainder of the 1990's and beyond. The main focus is on achieving the $6.3 billion savings over the period FY91-FY97 called for in Defense Management Report Decision (DMRD) 908, "Consolidating Depot Maintenance," 17 November 1990, and DMRD 908C, 12 January 1991. The strategy for achieving this goal was first delineated in the FY91-FY95 DDMC CBP, December 1991. This document reviews the progress to date in implementing that plan and notes the changes in strategy necessitated by changing conditions. As in the basic plan, savings are attributable to both near-term and long-range actions. Long-range actions are increased interservicing, depot maintenance competition, and improved capacity utilization. The total DMRD 908 projected savings are shown below:

Projected Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
Army	6.2	21.1	60.0	206.9	228.4	262.8	280.5	1,065.8
NAVAIR	175.0	202.5	260.8	282.4	293.7	123.6	110.8	1,448.8
NAVSEA	99.0	190.0	253.0	332.0	462.0	420.0	352.0	2,108.0
Air Force	58.4	149.3	235.5	299.8	367.4	292.7	305.2	1,708.3
Marine Corps	0.4	0.7	2.4	4.6	6.6	6.7	6.7	28.1
TOTAL	339.0	563.6	811.7	1,125.7	1,358.1	1,105.8	1,055.2	6,359.0

* FY91 column reflects savings achieved.

Near-term savings identified by the Services address a broad range of actions including downsizing of both the direct and indirect work force at depot installations, closure of facilities, cancellation of facility projects, and internal Service workload consolidations. Projected near-term savings are $3,207.6M plus $27M in cost avoidance for the Marine Corps.

Through increased interservicing, an estimated savings of $133.9M will be achieved during FY91-FY97. The objective of increased interservicing is to perform workloads at a lower cost, yet maintain the quality and schedule requirements of the Principal Service. Interservicing savings will be accrued from greater economies of scale through consolidations, which will reduce recurring cost to the gaining depot. The losing activity will realize savings through overhead reductions associated with reduced workload and downsizing its facilities to eliminate underutilized capacity. Progress has been made on several of the interservicing decisions specified in the first edition of the DDMC CBP. For example, a joint Tactical Missile Implementation Working Group has developed and is implementing a plan to consolidate tactical missile depot level maintenance for guidance

and control sections and Army ground support equipment at Letterkenny Army Depot (LEAD). Interservicing of the Army's Interior Bay/Ramp of Ribbon Bridge workload to Marine Corps Logistics Base Barstow has been completed, as has the transfer of the Air Force J79 engine workload to Naval Aviation Depot Cherry Point. The advent of public-public and public-private competition will help to increase interservicing, as evidenced by the FY91 award of Marine Corps 5-Ton Truck workload to Tooele Army Depot (TEAD) and subsequent transfer of additional FY92 5-Ton Truck workload by the Marine Corps to TEAD.

Competition will provide over 27 percent ($1,733.8M) of the total DMRD 908 savings. These savings will be realized through competition involving both public and private facilities. The competition demonstration program carried out under legislative authority during FY91 provided valuable experience to the Army, Air Force and Marine Corps in conducting and participating in public-private competition. These 14 competitions, eight of which were awarded to public depots, are currently projected to provide an FY91-FY97 savings of $22.8M. The Navy was not included in the demonstration program since Navy shipyards and aviation depots have not been constrained by legislation from engaging in competition, and they have established competition programs in place. Continuing legislation, similar to current legislation allowing the Services to compete in FY92 and FY93, is needed to allow the Services to compete in FY94 and beyond.

Savings attributed to improved capacity utilization total $1,283.7M. Most of the actions identified by the Services to achieve savings will impact depot capacity utilization. Capacity utilization savings will be achieved through redistribution of workloads within (consolidation) and among (interservicing) the Military Departments. These savings will be based on divestiture of unneeded resources and assumption of manufacturing and fabrication workloads when cost effective and efficient to do so. Capacity will be reduced by converting some depot maintenance facilities to other than depot maintenance functions, (e.g., warehouse, office space, etc.), sale of equipment and property, base closure, and laying away capacity not required in peacetime but necessary for surge or mobilization.

As is the case with this plan, future additions will reflect the progress made by the Services in implementing the various decisions and changes in strategies to achieve them.

In addition to describing the strategy for achieving DMRD 908 savings, this document also provides the joint Service Depot Maintenance Vision of the Future for FY95 and beyond. The vision statement addresses the direction the depot maintenance community must take to achieve the level of performance required to support mission needs and to ensure the viability of DOD depot maintenance capability. The vision foresees depots operating in a business-like, cost effective manner while maintaining a balance between military and economic objectives. The complete vision statement is contained in Appendix A.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

The FY92-FY97 Defense Depot Maintenance Council Corporate Business Plan (DDMC CBP) updates the strategy laid out in the FY91-FY95 DDMC CBP. That document provided a road map of how the Services will jointly manage the depot maintenance structure of the future. It contained the following objectives:

- Project savings resulting from increased efficiencies in depot maintenance
- Summarize individual Service strategies for achieving savings
- Portray essential elements of the Program Objectives Summary

Since the completion of the initial CBP, these objectives have remained unaltered. The FY92-FY97 DDMC CBP adds the additional objective of reflecting both progress toward achieving savings specified in Defense Management Report Decisions (DMRD) 908 and 908C as well as revisions to the initial strategies identified by the Services. This update continues to emphasize depot maintenance competition, interservicing, and consolidation to achieve savings.

The FY92-FY97 DDMC CBP addresses the joint Service strategy for managing the organic depot maintenance industrial base during FY92-FY97. It includes the projection of savings under DMRD 908. The primary data used in formulating depot maintenance strategy is projected depot maintenance workload and its corresponding funding. The basis for depot planning has been in, and will remain in, a state of flux. Although force structure reductions are a certainty, their range and depth are not always known well in advance of their implementation. The ability to accurately project workload for individual organic depots is even more difficult due to factors such as findings of the biennial Base Closure and Realignment Commissions and results of competition of organic workloads. These ambiguities in workload projection affect, in turn, the accuracy of savings projections. For example, the original DMRD 908 savings targets are based on the FY90 column of the FY91 President's Budget. That baseline assumed a certain force structure and corresponding depot maintenance requirement that has been, and will continue to be, substantially revised. Decreases in workload have made the achievement of savings a more difficult task. Although it represents a formidable challenge, the savings projected in this document are still attainable given the current workload. Further workload reductions, however, will significantly impede accomplishment of the current savings projections.

The impact of this state of uncertainty is that the strategies and projections set forth in the FY92-FY97 DDMC CBP for FY94 and beyond may well be altered significantly as time progresses. It must be recognized that given these circumstances, each Service and systems command made the most accurate projections possible based upon certain assumptions. Assumptions for the FY92-FY97 DDMC CBP are:

- Data included in the DDMC CBP will originate in:

  -- The Congressionally approved FY91 budget
  -- The Congressionally approved FY92 budget
  -- The FY93 budget submitted to Congress in January 1992
  -- The Service's approved FY93-FY97 Program Objective Memorandum (POM)
  -- The current Future Year Defense Program (FYDP)

- All realignments will be executed as scheduled

- Competition of workloads will be allowed

- There will be no additional workload/drawdown initiatives

- Less than 100 percent funding will be provided for customer requirements

1.2 DEFENSE DEPOT MAINTENANCE COUNCIL

The Deputy Secretary of Defense established the Defense Depot Maintenance Council (DDMC) in his 30 June 1990 memorandum, Strengthening Depot Maintenance Activities. The mission, organization, responsibilities, and functions of the DDMC were subsequently documented in DODD 5128.32, Defense Depot Maintenance Council, 7 November 1990. Its mission is to advise the Assistant Secretary of Defense (Production and Logistics) (ASD(P&L)) on initiatives for reducing costs and improving the efficiency and effectiveness of depot maintenance management and operations in DOD. The DDMC serves as a mechanism for coordinated review of DOD depot maintenance policies, systems, programs, and activities. It is the mechanism for jointly planning, monitoring, and evaluating the implementation of management improvement initiatives. The DDMC serves as a forum for exchange of information among the ASD(P&L) and Service officials responsible for the conduct of depot maintenance operations in the DOD. It also performs any other advisory duties relating to depot maintenance as required by the ASD(P&L).

The DDMC is chaired by the ASD(P&L). Its members are: the Deputy Assistant Secretary of Defense (Logistics); the Commander, US Army Materiel Command; the Commander, Air Force Materiel Command; the Deputy Chief of Naval Operations

(Logistics); the Deputy Chief of Staff for Installations and Logistics, Headquarters, US Marine Corps; and the Director, Defense Logistics Agency.

1.2.1 Service DDMC Support Structure

The Joint Logistics Commanders (JLC) community has provided most of the hands-on effort needed to implement DDMC actions. The fact that all the Service representatives on the DDMC are also members of the JLC has facilitated implementation of DDMC initiatives through JLC channels. As the depot maintenance policy agent for the JLC, the Joint Policy Coordinating Group on Depot Maintenance (JPCG-DM) and its Executive Group have played the pivotal role in implementing the decisions of the DDMC. Through JPCG-DM and Executive Group leadership, necessary oversight was provided to complete numerous initiatives, plans, and studies.

1.3 DEPOT MAINTENANCE VISION OF THE FUTURE

While the Services have been focusing on implementing the basic DDMC Corporate Business Plan actions for the period FY91-FY95, they also have been planning for the long term as well. The following goals have been established for achievement by FY95:

1. Maintain Service management of depot maintenance.
2. Provide "best value" for every DOD dollar spent on depot maintenance. Achieve this through:

    - Reduced cycle time in maintenance
    - Improved flexibility in the industrial and management process, physical resources, and workforce to adjust to uncertain and changing workloads
    - Increased quality and effectiveness in maintenance performance
    - Increased efficiency

3. Maintain capability to support both peacetime and contingency requirements
4. Identify and satisfy 100 percent of customer requirements
5. Increase ability to operate in a business-like fashion without rules constraining this capability
6. Increase our ability to compete "two ways" and on a level playing field

    - Compete within the DOD depot maintenance community
    - Compete for the workload that goes to contract (repair)
    - Compete for workload that goes to industry (manufacturing)

7. Have environmentally compliant depots

These goals were incorporated into The Depot Maintenance Vision Statement for 1995 and Beyond (see Appendix A), which addresses the direction the depot maintenance community must take to achieve the level of performance required to support mission needs and to ensure the viability of DOD maintenance capability. The vision statement begins with the following preamble:

> ***The Army, Navy, Air Force and Marine Corps depot maintenance facilities are the cornerstones of defense readiness. The combined strengths of the depots, shipyards, ordnance stations and specialized depot maintenance activities, in partnership with the inventory and supply activities of the Services and Defense Logistics Agency, form an efficient and responsive industrial base that is essential to the sustained application of land, sea and air power in peacetime and in war. They provide cost effective and technically superior maintenance, logistics and engineering support to our operating forces worldwide. The world class quality of their products is both recognized and expected by their customers.***

The vision foresees depots operating in a business-like, cost effective manner while maintaining a balance between military and economic objectives. The depots will evolve into smaller, more specialized activities making optimal use of state-of-the-art maintenance equipment and information management systems. Capacity utilization will be optimized. Environmental and safety laws and regulations will be complied with. The work force will be comprised of multi-skilled personnel who can adjust to changing production priorities and respond to competitive opportunities. Management and labor will operate as a team with the full support of unions and other employee groups. New investment in organic facilities will be based on strategies developed by the DDMC and will be kept at a minimum level that sustains a modern, efficient, and technologically responsive industrial base. In sum, the Services will achieve a mutually supportive, cost effective, and technically superior infrastructure which meets the needs of individual and unique Service missions while providing best value to the DOD.

This vision was determined through a strategic planning process. The first step in the process was to assess the depot maintenance operating environment to determine the factors and trends which will influence depot maintenance. In light of this assessment, goals and objectives for depot maintenance were developed and then incorporated into the vision statement. The final step in the process was to develop strategies for the implementation of the vision. These strategies identify actions which need to be taken in the next one to three years to implement the vision. The strategies are grouped into the following broad areas:

- Depot structure
- Management
- Operational
- Personnel and resources
- Environmental/safety
- Business
- Information technology

1.4 OVERVIEW OF DEPOT MAINTENANCE

The Services share the primary mission of manning, equipping, and training the military forces to provide for national security. Critical to this mission is the obligation to provide for the readiness and sustainability of the large inventory of equipment and weapon systems required to prosecute military actions. To support readiness and sustainability requirements, the DOD relies on a highly developed organic depot maintenance industrial base, which is augmented by commercial industry. The organic depot maintenance industrial base is essential for the initial responsiveness and sustainability for military contingencies until production can be supplemented by commercial industry.

With the easing of geopolitical tensions and the corresponding force structure reductions, the depot maintenance industrial base is being streamlined. The following discussion and tables show the current and projected magnitude of depot maintenance given those reductions that are currently known. Due to rounding, the figures in the tables in this chapter may not add exactly.

1.4.1 Estimated Depot Maintenance Budget

Maintaining the large DOD inventory of equipment and weapon systems requires considerable expenditure of funds. The estimated budget to accomplish the depot maintenance mission is depicted in Table 1-1. The budget data portrayed in this table is from the Principal's perspective--the military Service responsible for depot maintenance support to its own assigned equipment and who receives depot level maintenance support from Agent activities. It reflects the force structure reductions to the extent that they can be factored into the budget, the requisite savings from efficiencies associated with DMRD 908, and savings from other DMRDs related to depot maintenance. The current estimate of the budget is based on the FY93 President's Budget data, which addresses only FY93-FY94. For FY95-FY97, each Service provided the most accurate, current estimate of its budget possible consistent with POM data. The current estimate includes depot maintenance funds from the following sources: Operations and Maintenance (O&M); Procurement; Research, Development, Test and Evaluation (RDT&E); and other Defense Business Operations Fund (DBOF) activity groups (e.g., stock fund). The total budget rises from $13.3 billion in FY91 to $13.8 billion in FY92, drops to a low of $12.4 billion in FY94, and rises to a level of $13.0 billion for FY95 through FY97. The Marine

Corps increase from FY91 to FY92 reflects a supplemental increase for Operation Desert Storm requirements. The Air Force increase in FY93 is due to the inclusion in the budget of depot level repairables. The NAVSEA FY92 budget increase is attributable to Operation Desert Storm requirements as well as ship inactivations. Details of the NAVSEA workload are in Chapter 6.

Table 1-1
Current Estimate of Depot Maintenance Budget
(Then Year $ in Millions)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Army	2,247.0	2,168.8	1,849.8	1,670.7	1,725.7	1,619.8	1,501.2
NAVAIR	1,552.9	1,108.7	1,362.4	1,385.2	1,422.3	1,457.0	1,493.1
NAVSEA	4,217.2	5,164.7	4,429.2	4,175.8	4,716.2	4,733.3	4,685.5
NAVSUP	1,343.9	1,272.6	1,262.0	1,304.9	1,349.2	1,395.0	1,442.4
SPAWAR	33.4	37.5	38.3	38.7	39.8	43.9	46.3
Air Force	3,855.1	3,826.9	3,925.4	3,819.1	3,729.6	3,702.9	3,737.9
Marine Corps	139.2	237.9	63.0	100.2	105.3	121.4	171.7
TOTAL	13,388.7	13,817.1	12,930.0	12,494.6	13,088.1	13,073.2	13,078.1

Note: Army data includes only major items funded by P7M and depot-level reparable secondary items funded by DBOF (Supply Management Army).

Table 1-2 shows the current estimate of the depot maintenance budget broken out by contract and organic sources of repair. Since it is based on the same data shown in Table 1-1, it is also from the Principal's perspective and includes the same funding sources as Table 1-1. The joint Service organic budget rises from its lowest mark of $8.6 billion in FY91 to $9.1 billion in FY92, falls to $8.7 billion in FY93, and shows an overall rise to $9.2 billion in FY97. The contract budget reflects an overall decrease, falling from $4.7 billion in FY91 to a low of $3.7 billion in FY94, and increasing slightly thereafter. The organic contract split is consistently near the 70 to 30 percent mark, ranging from 64/36 percent in FY91 and 71/29 percent in FY95 through FY97.

Table 1-2
Current Estimate of Depot Maintenance Organic and Contract Budgets
(Then Year $ in Millions)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Army							
Organic	1,301.0	1,316.1	1,111.6	1,053.2	1,014.6	1,028.3	954.4
Contract	946.0	852.7	738.2	617.5	711.1	591.5	546.8
NAVAIR							
Organic	1,131.6	880.8	1,059.9	1,084.7	1,160.8	1,165.2	1,191.3
Contract	421.3	227.9	302.5	300.5	261.5	291.8	301.8
NAVSEA							
Organic	2,648.1	3,160.7	2,935.7	2,955.3	3,333.4	3,345.1	3,311.6
Contract	1,569.1	2,004.0	1,493.5	1,220.5	1,382.8	1,388.2	1,373.9
NAVSUP							
Organic	805.0	763.2	757.2	782.0	809.0	837.0	865.0
Contract	538.9	509.4	504.8	522.9	540.2	558.0	577.4
SPAWAR							
Organic	30.9	34.9	35.6	35.9	36.9	40.8	43.1
Contract	2.5	2.6	2.7	2.8	2.9	3.1	3.2
Air Force							
Organic	2,568.7	2,682.4	2,791.3	2,801.4	2,820.5	2,732.4	2,751.6
Contract	1,286.4	1,144.5	1,134.1	1,017.7	909.1	970.5	986.3
Marine Corps							
Organic	135.0	232.8	56.2	94.5	99.9	116.0	166.3
Contract	4.2	5.1	6.8	5.7	5.4	5.4	5.4
Total Organic	**8,620.3**	**9,070.9**	**8,747.5**	**8,807.0**	**9,275.1**	**9,264.8**	**9,283.3**
Total Contract	**4,768.4**	**4,746.3**	**4,182.5**	**3,687.6**	**3,813.0**	**3,808.5**	**3,794.8**
TOTAL	**13,388.7**	**13,817.1**	**12,930.0**	**12,494.6**	**13,088.1**	**13,073.2**	**13,078.1**

Note: Army data includes only major items funded by P7M and depot-level reparable secondary items funded by DBOF (Supply Management Army).

1.4.2 Depot Maintenance Personnel Levels

Table 1-3 provides an overall view of the peacetime assigned depot personnel levels by Service for FY91-FY97. The assigned depot maintenance personnel includes permanent military and civilian personnel, both direct and indirect. Appendix D provides personnel data by depot broken out by direct and indirect (for FY91-FY93), and military and civilian. The civilian personnel data presented in Table 1-3 and Appendix D are consistent with the most recent submission of the annual Five-Year Civilian Employment Plan required by Section 322(b) of the FY91 Defense Authorization Act. (Temporary and part-time personnel are not included in the data presented in Table 1-3 or the 322 Report.) When reviewing these personnel data, it should be kept in mind that indirect personnel totals may include both production indirect personnel as well as administrative personnel. Also, the Services differ in their designation of personnel as direct or indirect. Thus, computing the direct/indirect ratio from the data shown in Appendix D is not advised. Further, as the organic industrial base acquires increasingly sophisticated technology to accomplish its mission, the direct labor requirement may decrease, while the indirect labor requirement may increase. Use of a direct/indirect ratio therefore has marginal utility in identifying inefficiencies.

The personnel data in Table 1-3 in most cases reflects decreases throughout the period FY91-FY97. Army decreases reflect planned reductions in force (RIF) at Sacramento Army Depot (SAAD) due to base closure, and workload reductions at various depots. The Naval Air Systems Command (NAVAIR) decrease from FY91-FY92 reflects a RIF carried out during FY91 to streamline operations, reduce duplicative indirect layers caused by the creation of two hub Business Operating Centers, and prepare for public-private and public-public competitions. Naval Sea Systems Command (NAVSEA) reductions reflect RIFs of personnel planned at various naval shipyards due to workload fluctuations and reductions, and a RIF at Philadelphia Naval Shipyard during FY95 as a result of base closure. Air Force manpower figures portrayed in Table 1-3 are those reflected in the Section 322 Report submitted to Congress as required prior to implementing adverse action in an Industrial Fund activity. Air Force decreases reflect the impact of two factors: an early out coupled with a RIF implemented during FY91 to align to anticipated workload fluctuations in the FY91-FY95 timeframe, and attrition during the FY92-FY97 timeframe. Only limited hiring will be authorized during FY92-FY96 to replace attrition. Authority for hiring to replace attrition will become available during FY97. The Air Force will adjust manpower levels as funding and workload dictate. Marine Corps decreases are due to implementation of Program Budget Decision (PBD) 402, Marine Corps Industrial Fund Military Personnel, which requires a reduction of Marines in the Depot Maintenance Activities (DMA), increased reliance on part-time workers in lieu of permanent personnel, and continued streamlining of operations.

Table 1-3
Total Peacetime Assigned Depot Maintenance Personnel

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Army	16,301	15,991	15,013	13,061	12,060	12,532	12,532
NAVAIR	22,161	19,607	18,868	19,067	17,413	16,246	15,203
NAVSEA	60,571	55,384	50,751	45,684	40,126	42,525	47,316
SPAWAR	616	547	559	582	596	632	669
Air Force	31,670	31,059	30,457	29,865	29,287	28,721	28,721
Marine Corps	1,948	1,836	1,640	1,585	1,532	1,481	1,374
Total	**133,267**	**124,424**	**117,288**	**109,844**	**101,014**	**102,137**	**105,815**

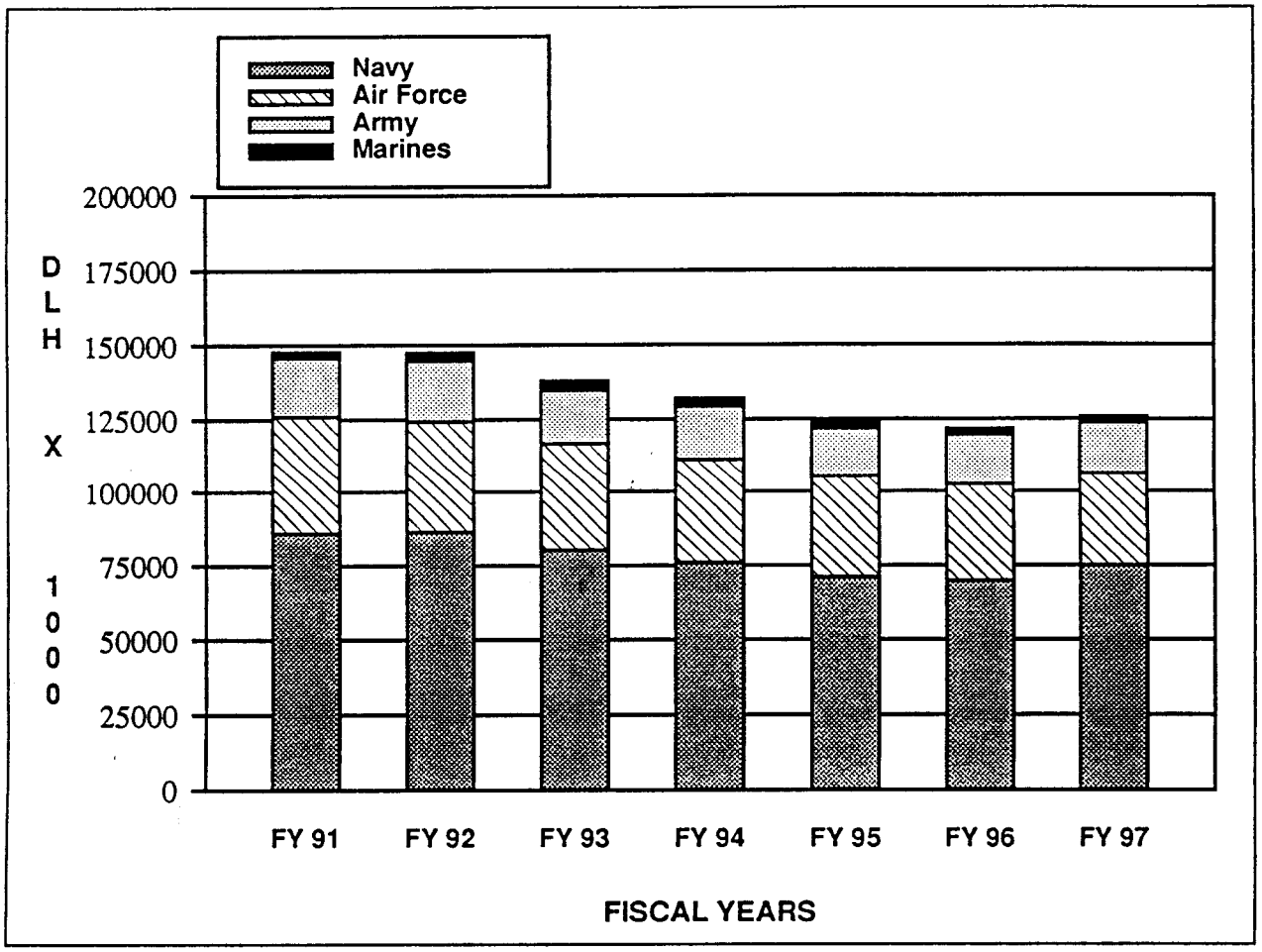
NOTE: Does not include data from the Naval Surface and Undersea Warfare Centers

1.4.3 Organic Peacetime Workload

During peacetime, the mission of the organic industrial base is to accomplish workloads to support the readiness of the operational forces. Chart 1-1 shows the organic peacetime workload trend for FY91-FY97 in direct labor hours (DLH) from the Agent Service's perspective--the organizational activity which furnishes the depot level maintenance support to another agency, Service, or systems command. The data reflects workload from all funding sources (i.e., Agent Service O&M, Procurement, and RDT&E appropriations, Agent Service stock fund, and reimbursables such as other Services and Foreign Military Sales customers).

The overall workload trend in Chart 1-1 is a decrease in workload. Data presented in Chart 1-1 reflect force structure changes (to the extent that they are known) and the planned workload shifts. The FY91 workload data depicted in Chart 1-1 was provided by the Services to support the DDMC CBP. It equates to the data presented in the Defense Business Operations Fund Amended FY1992/FY1993 biennial budget. An alternative data source, DOD 7220.9-M DOD Accounting Manual, Chapter 76, was considered for use, however, workload depicted in that system reflects only financially completed workload, but not work in process nor work that has been physically completed. Workload based on financial completion does not convey an accurate picture of work that was actually executed during a particular fiscal year.

Chart 1-1
Joint Service CONUS
Organic Peacetime Workload DLH(000)



Service	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97
Army	19,773	20,202	18,395	17,863	16,472	17,076	17,176
Navy	86,272	86,768	80,393	75,989	71,001	69,785	74,949
NAVAIR	*19,776*	*16,364*	*16,480*	*14,415*	*14,803*	*14,341*	*14,587*
NAVSEA	*65,453*	*69,295*	*62,771*	*60,400*	*54,983*	*54,204*	*59,103*
SPAWAR	*1,043*	*1,109*	*1,142*	*1,175*	*1,215*	*1,240*	*1,260*
Air Force	39,881	37,645	36,790	35,564	34,464	32,852	31,661
Marine Corps	2,067	3,083	3,392	2,712	2,367	2,222	2,224
Joint Service	147,993	147,698	138,970	132,128	124,304	121,935	126,010

NOTE: NAVAIR, NAVSEA and SPAWAR totals are subsets of the Navy total.

Table 1-4 provides the same organic peacetime workload data shown in Table 1-2 from the joint Service perspective sorted by major commodity.

Table 1-4
Joint Service Organic CONUS Peacetime Workload by Major Commodity
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Aircraft	58,798	53,104	52,890	49,875	49,545	47,931	46,992
Missiles	5,111	5,217	4,648	3,962	3,958	4,172	4,267
Ships	61,064	65,023	58,776	56,426	50,752	50,045	54,979
Combat Vehicles	5,489	6,841	7,028	6,374	5,188	5,228	5,215
Automotive	2,223	2,498	2,097	1,959	1,559	1,486	1,487
Construction	80	127	104	238	262	274	298
C-E	8,150	8,215	7,320	6,958	6,589	6,508	6,514
Ordnance	4,356	4,139	3,839	3,977	4,197	4,099	4,051
General Purpose	2,662	2,454	2,199	2,289	2,190	2,129	2,144
Other	60	79	69	69	63	63	63
TOTAL	147,993	147,698	138,970	132,128	124,304	121,935	126,010

1.4.3.1 Organic Software Support

A significant and increasing portion of the organic depot mission is to accomplish software support. Table 1-5 provides a portrayal of the software support that Agent Services provide to their customers. Table 1-6 shows the FY91-FY97 actual and projected funds needed to accomplish the software support workload.

Table 1-5
Joint Service Organic Depot Maintenance Software Support Workload
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Army *	267	351	554	343	343	343	343
NAVAIR	180	192	221	210	212	232	196
NAVSEA	12	7	5	9	28	28	28
SPAWAR	18	16	15	15	15	15	15
Air Force	2,447	2,948	3,379	3,719	3,397	3,386	4,017
Marine Corps	67	67	73	84	87	99	111
TOTAL	2,991	3,581	4,247	4,380	4,082	4,103	4,710

* Army Life Cycle Software Engineering (LCSE) Centers are collocated with Integrated Materiel Management Centers.

Table 1-6
Joint Service Organic Depot Maintenance Software Support
($ in Millions)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Army	23.0	30.0	48.5	30.0	30.0	30.0	30.0
NAVAIR	9.1	10.5	11.7	11.2	11.6	12.5	11.5
NAVSEA	0.7	0.8	1.0	1.1	1.2	1.3	1.4
SPAWAR	0.8	0.8	0.7	0.7	0.7	0.7	0.7
Air Force	113.1	146.2	186.4	186.9	194.2	217.2	224.4
Marine Corps	2.8	2.3	3.5	3.9	4.1	4.7	5.2
TOTAL	149.5	190.6	251.8	233.8	241.8	266.4	273.2

1.4.4 Contract Peacetime Workload

Table 1-7 presents the contract peacetime workload shown in Table 1-2 from the joint Service perspective sorted by major commodity.

Table 1-7
Joint Service Contract Peacetime Workload by Major Commodity
($ in Millions)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Aircraft	1,972.0	1,545.7	1,666.3	1,521.9	1,391.3	1,458.2	1,440.4
Missiles	292.2	232.9	222.1	206.0	220.1	169.2	192.2
Ships	1,408.5	1,838.1	1,308.8	1,053.8	1,201.5	1,206.9	1,192.6
Combat Vehicles	142.9	151.7	47.4	45.7	41.4	89.1	38.8
C-E	130.6	145.3	147.1	130.1	162.6	123.3	152.5
Ordnance	42.0	17.7	21.1	7.2	11.6	5.1	5.6
General Purpose	71.8	65.9	62.8	61.8	53.6	51.2	51.2
Other	169.4	239.4	202.0	138.1	190.7	147.4	144.0
NAVSUP	538.9	509.4	504.8	522.9	540.2	558.0	577.4
TOTAL	4,768.4	4,746.2	4,182.5	3,687.6	3,813.0	3,808.5	3,794.8

NOTE: NAVSUP data not available by major commodity.

1.4.5 Base Closure and Realignment Status

Under Public Law 100-526, the 1988 Base Closure Commission identified two depot maintenance activities for closure: Pueblo Army Depot Activity and Lexington-Bluegrass Army Depot. The depot maintenance mission of these activities is currently being realigned and transferred.

In the Defense Base Closure and Realignment Commission Report to the President, 1 July 1991, two additional depot closures were recommended under Public Law 101-510 and subsequently approved by Congress:

- Philadelphia Naval Shipyard was recommended for closure and preservation. The propeller facility (shops and foundry), Naval Inactive Ships Maintenance Facility, and the Naval Ship Engineering Station will remain in active status.

- Sacramento Army Depot was recommended for closure. Its workload will be realigned by competition to ensure the most cost effective distribution of work. The public-public competition will determine how best to distribute the current SAAD workload among Tobyhanna Army Depot, Anniston Army Depot, Red River Army Depot, Letterkenny Army Depot (LEAD), Corpus Christi Army Depot, and Sacramento Air Logistics Center.

The following realignments are also being carried out under Public Law 101-510:

- Consolidation of joint Service tactical missile guidance and control maintenance workload at LEAD. This action's inclusion under Base Closure and Realignment procedures was confirmed by the DOD General Counsel in a memorandum of 28 April 1992.

- Transfer of LEAD automotive workload to Tooele Army Depot

- Transfer of LEAD artillery workload to RRAD.

1.5 SAVINGS

FY91-FY95 savings targets totaling $3.9B were formally recorded in DMRD 908, 17 November 1990. The savings include both the near-term and long-range targets established by the Deputy Secretary of Defense in his 30 June 1990 memorandum, Strengthening Depot Maintenance Activities. DMRD 908 savings targets were extended through FY97 by DMRD 908C, 12 January 1991, which increased the total savings amount to $6.3B. On 16 December 1991, DMRD 908 was further adjusted to accommodate revised targets for NAVSEA. Current DMRD 908 savings targets are

portrayed in Table 1-8. (Table 1-8 delineates Navy savings targets between NAVAIR and NAVSEA.)

Table 1-8
DMRD 908 Savings Targets
($ in Millions)

	FY91	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Army	-21.3	6.2	101.3	171.5	255.6	513.3
NAVAIR	175.0	202.5	260.8	282.4	293.7	1,214.4
NAVSEA	99.0	190.0	253.0	332.0	462.0	1,336.0
Air Force	5.9	149.3	235.5	309.1	410.6	1,110.4
Marine Corps	0.2	0.5*	2.6	4.7	6.7	14.7
Total	258.8	548.5	853.2	1,099.7	1,428.6	4,188.8

* Does not include $27M Marine Corps M1 Tank facilitization cost avoidance.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Army	513.3	259.2	255.2	1,027.7
NAVAIR	1,214.4	123.6	110.8	1,448.8
NAVSEA	1,336.0	420.0	352.0	2,108.0
Air Force	1,110.4	292.7	305.2	1,708.3
Marine Corps	14.7*	6.7	6.7	28.1
Total	4,188.8	1,102.2	1,029.9	6,320.9

1.5.1 Service Projected Savings

The FY92-FY97 DDMC CBP provides the most recent Service projections for savings to meet the DMRD 908 savings targets. Service projections are based upon actions identified within the respective near-term savings plans submitted to the Office of the Secretary of Defense in August 1990, the savings actions identified in the FY91-FY95 DDMC CBP, current Service Business Plans, and any other changes identified since the issuance of the FY91-FY95 DDMC CBP. Table 1-9 provides a summary of the current Service savings projections, the DMRD 908 savings targets, and the variance between the target and projections. The FY91 column of Table 1-9 reflects savings achieved. These savings will be reviewed at the time of financial closure and adjusted if appropriate. More detailed savings projections for the individual Services are provided in later chapters.

Table 1-9
Summary of Joint Service Savings Projections
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Army	6.2	21.1	60.0	206.9	228.4	522.6
NAVAIR	175.0	202.5	260.8	282.4	293.7	1,214.4
NAVSEA	99.0	190.0	253.0	332.0	462.0	1,336.0
Air Force	58.4	149.3	235.5	299.8	367.4	1,110.4
Marine Corps	0.4	0.7**	2.4	4.6	6.6	14.7
Total	**339.0**	**563.6**	**811.7**	**1,125.7**	**1,358.1**	**4,197.9**
Target	**258.8**	**548.5**	**853.2**	**1,099.7**	**1,428.6**	**4,188.8**
Variance	**+80.1**	**+15.1**	**-41.5**	**+26.0**	**-70.5**	**+9.1**

* FY91 column reflects savings achieved.

** Does not include $27M Marine Corps M1 Tank facilitization cost avoidance.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Army	522.6	262.8	280.4	1,065.8
NAVAIR	1,214.4	123.6	110.8	1,448.8
NAVSEA	1,336.0	420.0	352.0	2,108.0
Air Force	1,110.4	292.7	305.2	1,708.3
Marine Corps	14.7	6.7	6.7	28.1
Total	**4,197.9**	**1,105.8**	**1,055.2**	**6,359.0**
Target	**4,188.8**	**1,102.2**	**1,029.9**	**6,320.9**
Variance	**+9.1**	**+3.6**	**+25.3**	**+38.1**

1.5.2 Service Savings by Category

The FY91-FY95 DDMC CBP provided for an orderly grouping of savings across the Services. These include the Service near-term and long-range savings categories established in the Deputy Secretary of Defense memorandum 30 June 1990, Strengthening Depot Maintenance Activities. The long-range savings were further subdivided by type of action; including interservicing, competition, and capacity utilization improvement. The FY91-FY97 joint Service savings projections by category are provided in Table 1-10. The FY91 column of Table 1-10 represents savings achieved.

Table 1-10
Summary of Joint Service Savings Projections By Category
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Near-Term	148.5	340.1	426.3	554.3	660.8	2,129.9
Interservicing	0.1	2.0	23.4	24.4	26.9	76.9
Competition	77.0	134.2	242.1	341.2	421.7	1,216.3
Capacity Utilization	113.3	87.3**	119.9	205.8	248.7	774.9
Total	**339.0**	**563.6**	**811.7**	**1,125.7**	**1,358.1**	**4,197.9**

* FY91 column reflects savings achieved.

** Does not include $27M Marine Corps M1 Tank facilitization cost avoidance.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Near-Term	2,129.9	581.0	496.7	3,207.6
Interservicing	76.9	27.8	29.2	133.9
Competition	1,216.3	241.5	276.0	1,733.8
Capacity Utilization	774.9	255.5	253.3	1,283.7
Total	**4,197.9**	**1,105.8**	**1,055.2**	**6,359.0**

1.5.3 Secretariat Implementation Tracking System (SITS)

Managing the process of strengthening depot maintenance requires maintaining information on Service actions and strategies to achieve savings and efficiencies. To provide visibility, the DDMC Secretariat has required that savings actions be recorded in an automated system. Accordingly, the SITS was developed to provide continuous visibility of Service actions and changes to those actions. Both projected and actual SITS savings data will be updated annually to support development of the DDMC CBP. Actual savings data will also be updated after the end of the fiscal year when data becomes available.

1.5.4 Defense Business Operations Fund (DBOF)

The Defense Business Operations Fund is the means by which DOD is implementing DMRD 971, DOD Financial Systems. The goal of DMRD 971 is to influence DOD managers and employees to provide the best support at the lowest cost through improving DOD financial systems. DMRD 971 institutionalizes a process and

structure that will support business (customer/provider) relationships. Establishing the DBOF is a way for DOD to achieve this goal. Major benefits of DBOF and DMRD 971 include:

- Better financial information that will support efforts to improve management and productivity

- Increased focus on cost and performance in support of the customer

- Full financial responsibility by the customer originator of the requirement

DBOF is a way for DOD to realign costs related to an output. Expanding the use of cost accounting principles, and performance and activity based budgeting in the DBOF should provide basic building blocks to achieve the objectives of DMRD 971. The long range goal is to move all of the support establishment into the DBOF. As more support establishment costs (i.e., capital budget, financial services, military personnel, etc.) are identified to a DBOF business area (e.g., depot maintenance, research and development), the initial impact will be an increased cost per output to procure services from the business area. Savings at the DOD level should be realized through consolidations with the benefit of increased visibility to the total cost associated with equipping or operating its military forces. By having visibility to the total costs related to an output, this information should influence DOD managers and employees to provide the best support at the lowest cost. It should be noted, however, that since depot maintenance facilities are industrially funded activities, they have been operating for many years on many of the principals upon which DBOF is based. In some cases, therefore, benefits anticipated from DBOF have already been realized in depot maintenance activities.

1.5.5 Impact of Stock Funding

DMRD 904, Stock Funding of Reparables, required that all Services finance the depot level maintenance of depot level reparables through use of the stock fund as opposed to the use of appropriated dollars. Anticipated benefits to the supply system include fewer component carcass returns to the depot, fewer customer demands, reduced throw away rates, and reduced inventory levels. Conversely, at least one Service, the Marine Corps, projects a 5 percent increase in overall repair costs. To date, this initiative has had no known impact on the achievement of DMRD 908 savings.

The Navy has been using this technique since 1984. Along with the advent of Reliability Centered Maintenance and increased use of organizational and intermediate support, stock funding has contributed to a significant reduction in Navy organic depot maintenance component repair workload. In the naval aviation community, this reduction was approximately 25 percent.

CHAPTER 2

DEFENSE DEPOT MAINTENANCE COUNCIL SUPPORT ACTIVITIES

2.1 INTRODUCTION

Numerous joint efforts have been undertaken to implement various Defense Depot Maintenance Council (DDMC) initiatives. This section recaps the progress of these efforts.

2.2 IMPLEMENTING DDMC CORPORATE BUSINESS PLAN (CBP) WORKLOAD DECISIONS

Three groups have been established to address specific aspects of DDMC workload decision implementation. This section identifies these groups and describes their activities.

2.2.1 Implementation Working Group (IWG)

The IWG, chaired by the Army, was chartered on 26 March 1991 by the Joint Policy Coordinating Group on Depot Maintenance (JPCG-DM) Executive Group. Its mission is to coordinate the implementation of interservice and consolidation decisions specified in both the Joint Service Business Plan and FY91-FY95 DDMC CBP.

To ensure consistency, the IWG developed a set of guidelines to be used in implementing the various actions. This guidance package describes responsibilities for offices of primary and secondary responsibility, establishes milestones for submitting implementation plans, and provides a common format for those plans. The format includes: identification of the action, workload requirements, implementation strategies, plan of action & milestones (POA&M), implementation structure (i.e., points of contact and responsibilities), a summary, and approval signatures.

The IWG reports the progress of the consolidation and interservicing actions to the JPCG-DM on a quarterly basis. To meet this requirement, the working group developed standard milestones for the Services to use in developing POA&Ms.

2.2.2 Joint Service Competition Working Group (JSCWG)

The JSCWG was chartered on 26 March 1991 by the JPCG-DM Executive Group with members from each Service and the Joint Depot Maintenance Analysis Group (JDMAG). The JSCWG, which is chaired by Naval Air Systems Command (NAVAIR), was established to advise the JPCG-DM Executive Group on depot maintenance workload competition issues. The group is tasked to develop procedures and guidance

for conducting public-private and public-public competitions of depot maintenance workloads. Additionally, the JSCWG is tasked to provide continuing advice and assistance to the Services conducting such competitions. Efforts are underway to establish procedures and guidance relevant to public involvement in competitions with final documents expected in FY92.

2.2.3 Tactical Missile Implementation Working Group (TMIWG)

On 12 December 1991, the DDMC directed the Army to prepare a single plan for the consolidation tactical missile maintenance at Letterkenny Army Depot (LEAD), and to submit this plan to the Assistant Secretary of Defense for Production and Logistics (ASD(P&L)). To develop and implement this plan, the TMIWG was established as a formal joint Service working group (with the Army as lead Service) on 7 January 1992. The Tactical Missile Maintenance Consolidation Plan for Letterkenny Army Depot was subsequently developed and presented to the DDMC on 13 March 1992. The TMIWG is now coordinating the implementation of the plan and will continue to meet on a recurring basis until the completion of the consolidation.

2.3 IMPLEMENTATION STATUS OF GENERIC STUDIES

At its first meeting, the DDMC commissioned four generic studies with general application. The basic DDMC CBP summarized objectives and results of these studies. The following paragraphs recap measures taken to implement study recommendations.

2.3.1 Capacity/Utilization Study

The study report submitted by the Joint Logistics Commanders (JLC) to the ASD(P&L) on 3 December 1990 included recommended formulas for computing capacity and utilization index data. The ASD(P&L) response of 25 January 1991 approved the study recommendation for basing capacity on work positions and also approved the study's recommended standard factors for facility availability and annual productive hours for use in DDMC commodity studies and consolidation considerations. Subsequently, Service capacity and utilization data used in the commodity studies, as well as data presented in the basic DDMC CBP, were based on these recommendations. The ASD(P&L) also stated that DOD 4151.15-H, DOD Maintenance Production Shop Capacity Measurement Handbook, would be revised based on the study recommendations. A draft revision was provided for Service coordination on 12 November 1991. Service comments on the draft were then submitted, but publication of the revised handbook is pending until approval of DODD 4151.18, Maintenance of Military Materiel. That directive will provide authority for the handbook. Once the directive is approved, publication of the DOD Capacity and Utilization Measurement Handbook, which will now be designated DOD 4151.18-H, will proceed.

2.3.2 Depot Maintenance Performance Measurement System (DMPMS) Study

The Depot Maintenance Performance Measurement System Study Report was submitted to ASD(P&L) on 9 January 1991. The report recommended establishment of a DMPMS consistent with Total Quality Management principles comprised of various performance indicators within the following key areas: effectiveness, efficiency, quality, productivity, innovation, capacity utilization, and cost performance. Phase II of the study was then initiated to address development of Service implementation plans and collecting prototype data from selected depots to demonstrate the viability of the system. Service implementation plans and prototype data were included in the Phase II report dated 3 December 1991.

In order to ensure continued enhancement of the DMPMS, the JPCG-DM, on 14 May 1991, chartered the Joint Performance Measurement Group (JPMG). The JPMG was tasked to coordinate the development of the DMPMS, to work toward achieving comparability, consistency, accuracy of DMPMS data, to act as the focal point for inquiries pertaining to DMPMS data, and to serve as a forum for the exchange of performance measurement information and ideas throughout the depot maintenance community. The JPMG will also coordinate development of the quarterly DMPMS data reports, the first of which was submitted to ASD(P&L) on 11 March 1992.

The JPCG-DM directed on 3 June 1992 that the JPMG develop and incorporate depot maintenance performance indicators based on the Theory of Constraints (TOC) into the DMPMS.

2.3.3 Cost Comparability Study

The 23 January 1992 version of the Cost Comparability Handbook was approved by the ASD(P&L) for distribution and use. The handbook will be used to develop and evaluate all cost data submitted by public activities as part of competitive proposals to provide depot support. The Cost Comparability Committee has been established as a standing committee of the JPCG-DM and will be responsible for handbook updates needed to accommodate changes in cost accounting policies and practices. Also, the committee has developed training on cost comparability concepts and application of the handbook and is providing the training to a diverse functional audience.

2.3.4 Maintenance Management Information Systems (MMIS) Study

The primary recommendation of the MMIS study was the establishment of a full time Executive Agent for MMIS reporting directly to the DDMC and charged with executing approved depot level MMIS plans. Based upon a DDMC determination, the Office of the Secretary of Defense designated the Secretary of the Air Force as the Executive Agent on 17 May 1991. This resulted in the establishment of the DOD Executive Agent for Depot Maintenance Systems at Wright-Patterson Air Force Base, OH.

Subsequently, the Executive Agent became the Directorate for Depot Maintenance Systems of the Joint Logistics Systems Center (JLSC).

2.4 JOINT LOGISTICS SYSTEMS CENTER

The JLSC was created by ASD(P&L) on 3 March 1992 to consolidate the executive agents for depot maintenance and material management functions into a single organization. The JLSC is a joint center with the Air Force as the Executive Service. The JLSC derives its command authority from the Air Force Chief of Staff through the Air Force Materiel Command (AFMC). Functional policy direction and oversight are provided by ASD(P&L) as are JLSC authority, scope and funding approval. Corporate Information Management (CIM) initiative and technical policy direction and oversight are provided by the Assistant Secretary of Defense (Command, Control, Communication, and Intelligence) (ASD(C^3I)). The mission of the JLSC is to achieve corporate information management goals for the DOD logistics business area by managing the design, development, implementation and maintenance of an integrated DOD corporate logistics process system and facilitating development and implementation of improved business practices. Its major operating directorates are the Directorate for Depot Maintenance, the Directorate for Materiel Management, the Directorate for Corporate Integration, and the Directorate for Technical Integration.

2.4.1 Directorate for Depot Maintenance

The Directorate of Depot Maintenance is comprised of four divisions. The Maintenance Business Processes Division is the largest, dealing with corporate depot maintenance systems. This division analyzes the management information systems of depot maintenance, including depot planning, financial management, production/workload planning, production engineering, production control, materiel management, quality assurance, performance measurement, production facilities, administration, and equipment management.

The Maintenance Industrial Processes Division deals with support systems and technologies involving areas like technical data and hazardous waste. The following are some of the process areas within which this division is involved:

- Shop floor support, including technical data, documentation, engineering data, design drawings

- Depot maintenance overhaul and repair, including flexible computer integrated manufacturing (FCIM), electronic data interchange (EDI), bar-coding, and microcircuit technology in logistics applications (MITLA)

- Systems approaches to minimizing hazardous waste

The Maintenance Implementation Division deals with the process of implementing systems at the component depots. This division is actively involved in the following areas:

- Site assessments
- Implementation of near-term initiatives designated as having a high payback potential
- Planning for the future migration of corporate systems into the component maintenance depots
- Implementation of future corporate systems

The Business Operations Division evaluates systems from a technical perspective. Together with the other functional divisions, this division analyzes how systems can properly interface across DOD. This division is also responsible for building and maintaining a corporate depot maintenance data encyclopedia which serves as a repository for business process models and provides a means for further information engineering. In support of the Directorate, this division is additionally responsible for the management of all directorate resources, including manpower, equipment, and money.

CHAPTER 3

UPDATE OF SERVICE BUSINESS STRATEGIES

3.1 INTRODUCTION

Since the issuance of the FY91-FY95 Defense Depot Maintenance Council Corporate Business Plan (DDMC CBP), the Services have begun the task of implementing prescribed savings and efficiency initiatives. During the course of implementation, the Service strategies to achieve savings have required adjustment. While the majority of the initiatives delineated in the FY91-FY95 DDMC CBP remain viable, others have been discontinued for various reasons. Further, the scope of the savings period was expanded through FY97. This chapter focuses on the current Service strategies to achieve both near-term and long-range savings and increase efficiencies. Table 3-1 provides the current joint Service projected savings based on current Service strategies. Due to rounding, figures in tables in this chapter may not add exactly.

Table 3-1
Summary of Joint Service Projected Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Near-Term	148.5	340.1	426.3	554.3	660.8	2,129.9
Interservicing	0.1	2.0	23.4	24.4	26.9	76.9
Competition	77.0	136.1	243.8	343.2	419.8	1,220.8
Capacity Utilization	113.3	87.3**	119.9	205.8	248.7	774.9
Total	**339.0**	**563.6**	**811.7**	**1,125.7**	**1,358.1**	**4,197.9**
Target	**258.8**	**548.5**	**853.2**	**1,099.7**	**1,428.6**	**4,188.8**
Variance	**+80.1**	**+15.1**	**-41.5**	**+26.0**	**-70.5**	**+9.1**

* FY91 column reflects savings achieved.
** Does not include $27M Marine Corps M1 Tank facilitization cost avoidance.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Near-Term	2,129.9	581.0	496.7	3,207.6
Interservicing	76.9	27.8	29.2	133.9
Competition	1,216.3	241.5	276.0	1,733.8
Capacity Utilization	774.9	255.5	253.3	1,283.7
Total	**4,197.9**	**1,105.8**	**1,055.2**	**6,359.0**
Target	**4,188.8**	**1,102.2**	**1,029.9**	**6,320.9**
Variance	**+9.1**	**+3.6**	**+25.3**	**+38.1**

3.2 ARMY

The Army strategy for achieving Defense Management Report Decision (DMRD) 908 savings is detailed in the Army Corporate Business Plan (ACBP). The ACBP allows for the preservation of necessary depot maintenance capability to support mission requirements, both in peacetime and wartime. The ACBP addresses near-term and long-range savings, includes Congressionally directed realignments from the Base Realignment and Closure (BRAC) process, and provides for the downsizing of the Army organic industrial base in consonance with force structure reductions. It considers the Continental United States (CONUS) and Outside the Continental United States (OCONUS) depot maintenance operations.

Savings projected for the Army are based on several source documents including the FY91-FY95 DDMC CBP, the current ACBP, and any other changes since the issuance of the FY91-FY95 DDMC CBP. The Army savings strategy also centers on continuing with its concept of Centers of Technical Excellence (CTX) and supports the final evolution of the concept within the Army organic structure. Table 3-2 provides a summary of total projected savings for the Army for the period FY91-FY97. It also shows the established savings targets and variances between targets and savings.

3.2.1 Army Near-Term Strategy

The Army's near-term strategy, which is currently projected to achieve a savings of $339.2M, is based on two actions. The first is the closure of Sacramento Army Depot (SAAD). The original plan to distribute the SAAD workload to other Army depots was modified by the 1991 BRAC process. It was directed that the SAAD workload be competed between selected Army depots and Sacramento Air Logistics Center (SM-ALC). Accordingly, the Communications-Electronics Command (CECOM) was assigned to lead development of statements of work and competition packages for the SAAD workloads. Nine logical grouping have been identified to cover the complete SAAD workload. Current schedules call for the award process to be completed by the end of FY93. Projected FY91-FY97 savings to the Army from the SAAD closure are $157.1M. Further savings from this action will generate $148.5M as a result of lower rates charged to customers. The second element of the Army near-term strategy is the consolidation of the tactical vehicle workload from Letterkenny Army Depot (LEAD) to Tooele Army Depot (TEAD), with a projected FY91-FY97 savings of $33.7M. The decrease in total Army near-term savings from the basic DDMC CBP will be offset by increases in long-range consolidation savings.

Table 3-2
Summary of Army Projected Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Near-Term	0.0	4.2	17.2	62.4	74.6	158.3
Interservicing	0.0	0.0	0.5	1.4	1.9	3.8
Competition	-1.5	7.2	15.0	23.0	31.0	74.7
Capacity Utilization	7.7	9.7	27.3	120.1	120.9	285.7
Total	**6.2**	**21.1**	**60.0**	**206.9**	**228.4**	**522.5**
Target	**-21.3**	**6.2**	**101.3**	**171.5**	**255.6**	**513.3**
Variance	**+27.5**	**+14.9**	**-41.3**	**+35.4**	**-27.2**	**+9.2**

* FY91 column reflects savings achieved.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Near-Term	158.3	93.4	87.5	339.2
Interservicing	3.8	2.5	2.6	8.9
Competition	74.7	28.0	36.0	138.7
Capacity Utilization	285.7	138.9	154.4	579.0
Total	**522.5**	**262.8**	**280.5**	**1,065.8**
Target	**513.3**	**259.2**	**255.2**	**1,027.7**
Variance	**+9.2**	**+3.6**	**+25.3**	**+38.1**

3.2.2 Army Long-Range Strategy

The Army long-range strategy of increased interservicing, increased competition, and achieving optimum utilization of its organic depots continues with some adjustments since the initial DDMC CBP. The significant changes include lower projected savings from interservicing and competition, but increased savings through consolidations and resultant increased capacity utilization.

In the previous DDMC CBP, the Army projected interservicing savings were $6.2M for FY91-FY95. Revised interservicing savings projections for the FY91-FY95 period have been reduced to $3.8M, with an additional savings in FY96-FY97 of $5.1M, for a

total FY91-FY97 projection of $8.9M. The FY91-FY95 reduction is primarily a result of fewer projected savings for the ground communications and electronics (GCE) interservicing action, which is attributable to slippage of the start year from FY92 to FY93. Savings have begun to accrue for the Army Interior Bay/Ramp of Ribbon Bridge interservicing action with the transfer of that workload to Marine Corps Logistics Base (MCLB) Barstow in October 1991. The FY91-FY97 Army ground support Gas Turbine Engines (GTE) interservicing action is progressing towards implementation as projected in FY93. San Antonio Air Logistics Center (SA-ALC) will accomplish the work.

Projected savings from competition of Army workloads for the period FY91-FY95 have also been revised. Current FY91-FY95 competition savings projections are $74.7M, an increase of approximately $14.6M from the original Corporate Business Plan projection. The increase is based primarily on competing more workload than originally planned in the outyears. Workloads added to the Army FY92 competition program include the M60 T142 Track and the M113A2 Engine. The following workloads have been deleted from the Army FY92 competition program: AH-1 Main Rotor Hub, AH-1 Gear Box 42d, AH-1 Gear Box 90d, OH-58 Swashplate, UH-1 Swashplate, UH-1 Quill Assembly (overhaul), UH-1 Tail Boom, UH-1 Main Rotor Hub, UH-1 Quill Assembly (repair), 5 Ton Engine, and the 5 Ton Transfer. These workloads were deleted because workload levels for the competition year were not sufficient to warrant competition. Proposed FY93 competitions are identified in Chapter 5.

Capacity utilization continues as the keystone of the Army savings strategy. This is evident by the increase in both projected savings and the proportion of savings anticipated from this category of savings. The Army's intent is to maximize the depot maintenance utilization commensurate with its changing workloads. This will be primarily achieved through consolidation actions including the closure of maintenance operations at SAAD, and Mainz Army Depot (MZAD). Additional consolidations of tactical missile work at LEAD, mobile rail shops at TEAD, artillery at Red River Army Depot (RRAD), rotary wing component contract work to Corpus Christi Army Depot (CCAD), and tactical vehicles at TEAD will improve the Army depot capacity utilization. Even with these actions, excess capacity will remain, primarily as a result of the 25 percent force structure reduction occurring through FY95. Accordingly, the Army is pursuing a policy of laying away excess capacity to achieve an Army target of 90 percent capacity utilization. By reducing and consolidating work positions, all or part of some buildings could be placed in layaway. As a result, the cost of ownership will be reduced without irreversibly affecting the capacity of the Army depots. Because facilities and equipment in these laid away areas will remain, they could quickly be reactivated if needed for mobilization or peacetime workload increases.

There are significant enhancements to the Army capacity utilization initiatives. The MZAD Combat/Artillery/Tactical Vehicle (CAT) consolidation savings have been increased by $85.5M to project $183.5M in savings for the FY91-FY95 period, with an additional savings of $176.7M for FY96-FY97. The objective of this action is to close MZAD

maintenance operations and realign the workloads to CONUS. Specific workload transitions include M1A1 Tanks and heavy combat vehicles to Anniston Army Depot (ANAD), Bradley Fighting Vehicles to RRAD, tactical vehicles to TEAD, and artillery to LEAD until such time as the workload is moved to RRAD. The M113 family of vehicles from MZAD will be competed. This action is timely in that the Army forces in Europe are being significantly reduced. Details of the plan to close down MZAD and realign the workload are contained in the MZAD Closure Plan, 3 January 1992.

The initiative to consolidate rotary wing workloads at CCAD also has slightly increased projected savings for the FY91-FY95 period. This initiative applies organic depot maintenance capability to components of four aircraft systems, the AH-64, UH-60, CH-47D, and the OH-58D It will move contract work to a lower cost organic capability. The completion schedule for these transitions is as follows: UH-60 in FY93, AH-64 in FY94, CH-47D in FY94, and OH-58D in FY96. Details of this action are contained in the Implementation Plan to Transition Rotary Wing Components from National Contract Maintenance to CCAD.

The savings to the Army for the tactical missile consolidation, which will consolidate depot maintenance workloads for DOD at LEAD, have been revised. Expected savings for FY91-FY95 have been reduced from $62.4M to $4.2M due to workload decreases, increases in transition costs, and learning curve costs. Total Army FY91-FY97 savings for this action are $59.0M. A related initiative that has also undergone revision is the Missile Military Construction (MILCON) Program (MCP) savings. The Army has cancelled the Army Tactical Missile System (ATACMS) maintenance facility at ANAD (project P-31515), with a savings of $5.5M for FY92. Cancellation of the Inertial Guidance Facility, also at ANAD (project P-32320), has been rescinded and associated savings have been dropped. That facility will be built to support maintenance requirements for Army combat vehicle inertial guidance systems.

Other significant Army consolidation initiatives include capacity layaway, artillery consolidations, Industrial Plant Equipment (IPE), the TEAD tactical vehicle component consolidated maintenance facility, and the mobile rail repair shop consolidation. TEAD will be the recipient of a modern facility which will be used for tactical vehicle component maintenance and generator (general purpose equipment) maintenance. FY91-FY97 savings associated with this initiative total $41.5M. The artillery consolidation initiative projects an FY91-FY97 savings of $37M. This initiative calls for the movement of the depot level artillery maintenance mission from LEAD to RRAD. The IPE initiative will move the Army's IPE maintenance mission from Seneca Army Depot (SEAD) to the Defense Logistics Agency (DLA) Mechanicsburg facility and will consolidate Army IPE workload with the current DLA IPE maintenance mission. Associated FY91-FY97 savings are projected at $10.3M for the SEAD workload and an additional amount for other Army IPE workload.

3.3 NAVAL AIR SYSTEMS COMMAND

The Naval Air Systems Command (NAVAIR) is committed to providing affordable, high quality depot industrial support to its customers. To achieve and maintain this objective, DMRD 908 initiatives in the first iteration of the DDMC CBP were formulated within the framework of the existing Naval Aviation Depot (NADEP) infrastructure and business base. These initiatives were defined in the Naval Aviation Depot Business Plan, 18 December 1990, and are part of a total NAVAIR strategy for reducing depot support costs relative to the FY90 column of the FY91 President's budget. The NAVAIR initiatives described in the FY91-FY95 DDMC CBP are still valid; however, the NAVAIR strategy has evolved over the past year to incorporate additional cost savings initiatives as a result of DDMC CBP actions, and has been planned to synchronize with joint Service efforts. Future global, political, and economic factors may force reevaluation of both initiatives and strategy.

Table 3-3 summarizes the NAVAIR FY91 savings achieved, current savings projections, targets, and variances. DMRD 908 savings targets have been redistributed and extended through FY97 in accordance with Office of the Secretary of Defense (OSD) guidance. NAVAIR's redistributed savings projections are the result of a process that assesses progress to date, new strategies, and changes in budget based workload expectations. Allocation of savings objectives will be balanced among initiatives, based on opportunities, as the DDMC CBP evolves from year to year. The NAVAIR focus is to achieve a total savings of $1.4B by the end of FY97 without compromising support to the operating forces. NAVAIR will continue to update and adjust its planning to reflect past accomplishments, lessons learned, and new budget data.

3.3.1 NAVAIR Near-Term Strategy

The initiatives to achieve the projected NAVAIR near-term savings of $448.8M include streamlining; aircraft Standard Depot Level Maintenance (SDLM) and engine rework, single siting; and consolidation of component repair, calibration and support equipment rework. $6.4M of savings has been documented, leaving a balance of $442.4M to be achieved by the end of FY97. Near-term projected savings have been updated to depict new developments in the areas of streamlining and single siting. The streamlining projections were increased to reflect recurring savings that will be achieved from a personnel reduction in force in October 1991.

Table 3-3
Summary of NAVAIR Projected Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Near-Term	6.4	92.5	76.4	89.9	93.5	358.7
Interservicing	0.0	0.0	10.9	9.4	10.8	31.1
Competition	64.2	57.8	111.0	134.5	135.6	503.1
Capacity Utilization	104.4	52.2	62.5	48.6	53.8	321.5
Total	**175.0**	**202.5**	**260.8**	**282.4**	**293.7**	**1,214.4**
Target**	**175.0**	**202.5**	**260.8**	**282.4**	**293.7**	**1,214.4**
Variance	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

* FY91 column reflects savings achieved.

** Current NAVAIR DMRD 908 target adjusted for A-6 Rewing (-$45.5M), Force Structure Reductions (-$2.1M), Miscellaneous Changes (-$4.6M), change in Competition target as a result of decreased force levels (-$41.7M), FY96 and FY97 additions ($234.4M), and a total savings target increase ($80.0M).

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Near-Term	358.7	44.5	45.6	448.8
Interservicing	31.1	10.6	10.9	52.6
Competition	503.1	24.6	28.2	555.9
Capacity Utilization	321.5	43.9	26.1	391.5
Total	**1,214.4**	**123.6**	**110.8**	**1,448.8**
Target	**1,214.4**	**123.6**	**110.8**	**1,448.8**
Variance	**0.0**	**0.0**	**0.0**	**0.0**

3.3.1.1 Streamlining

NAVAIR is replacing its infrastructure of six self-contained depot activities with an interdependent naval aviation depot corporate organization. This organization is comprised of six streamlined and downsized engineering and support facilities, each serving a specific and unique fleet support niche within the overall DOD depot

infrastructure. Streamlining savings will result from the establishment of depot hubs at NADEP Norfolk and NADEP North Island. The hub structure effectively consolidates management, administrative, and oversight functions that were performed redundantly at two or more NADEPs. When fully implemented the hub structure will incorporate more efficient organizational structures reflecting program manager orientation and accountability, product specialization, and streamlined processes at each depot. The depot hubs are major industrial support centers co-located with the aviation Type Commanders, carrier berthing, naval air stations, supply center operations, and major Aircraft Intermediate Maintenance Departments. Each depot hub consists of a Business Operating Center (BOC) and accomplishes consolidated non-headquarters corporate business overhead functions. Each hub also has a Depot Production Center (DPC) providing technology and commodity focused repair and manufacturing services in support of assigned weapon systems. The Norfolk hub is administratively linked to specialized DPCs at NADEP Cherry Point and NADEP Jacksonville. The North Island hub is administratively linked to NADEP Pensacola and NADEP Alameda.

Table 3-4 provides a summary of savings associated with the hub structure and streamlining. It is important to note that the majority of these savings result from civilian losses between October 1990 and October 1991. The savings reflect reduced indirect personnel overhead expenses from both hub structure and streamlining initiatives associated with single siting of engines and aircraft.

Table 3-4
Summary of NAVAIR Streamlining Cost Savings
($ in Millions)

FY91	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
0.0	78.5	79.3	80.2	81.1	32.0	33.0	384.1

3.3.1.2 Aircraft Single Site Realignment

As depicted in the FY91-FY95 DDMC CBP, NAVAIR will have single sited all aircraft SDLM programs (Modification, Corrosion, and Paint Program (MCAPP) in the case of the F/A-18) by the end of FY92 (except A-6 major modification rewing effort which requires two depots) to reduce the number of product lines managed at a given depot. Single siting provides the opportunity to significantly reduce depot maintenance support costs without impacting Fleet support. Aircraft SDLM consolidation will result in greater efficiency and a reduction in the cost of variable indirect manhours required to manage programs at more than one NADEP. Ad hoc maintenance programs such as crash/battle damage repair, drive-in modifications, and one of a kind manufacturing efforts are not included in the single siting umbrella. These projects will be accomplished by the activity

with the capacity and resources which best match the customer's schedule and financial requirements (for example, it is generally not efficient to ferry a helicopter from the west coast to the east coast SDLM facility in order to install a minor airframe change kit; the work in this example would be done at a west coast NADEP or by a field team). Aircraft SDLM/MCAPP single siting will produce cost savings of $47.1M for FY91-FY97 as shown in Table 3-5.

Table 3-5
Summary of NAVAIR Aircraft Single Siting Cost Savings
($ in Millions)

FY91	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
5.8	11.4	-5.7	6.8	9.5	9.6	9.7	47.1

All aircraft SDLM/MCAPP single siting initiatives are currently on or ahead of schedule. Table 3-6 is the NAVAIR single siting plan adjusted to reflect actions from the Joint Service Business Plan (JSBP), 28 February 1991.

Table 3-6
NAVAIR Aircraft Single Siting

AIRCRAFT	BEFORE SINGLE SITING	AFTER SINGLE SITING	COMPLETION DATE
A-6*	Alameda/Norfolk	Alameda/Norfolk	TBD
P-3	Alameda/Jacksonville	Jacksonville	FY91
S-3	Alameda	Alameda	
E-2/C-2	North Island	North Island	
F-14	Norfolk/North Island	Norfolk	FY91
F-18	Jacksonville/North Island	North Island	FY92
CH-46	Cherry Point/North Island	Cherry Point	FY91
OV-10	Cherry Point	Cherry Point	
RF-4	Cherry Point	Cherry Point	
A-4	Pensacola/Cherry Point	Cherry Point	FY91
AV-8	Cherry Point	Cherry Point	

* Will be single sited upon completion of rewing.

3.3.1.3 Engine Single Site Realignments

Single siting of NAVAIR engine overhaul responsibilities will reduce the number of engine depots from five to three. This will result in increased interservicing opportunities and, in the longer term, recurring cost savings. Although engine rework consolidations do not generate near-term savings within the Future Year Defense Program (FYDP), because of implementation costs, the gaining DPC will be able to accomplish work at a price equal to or less than that presently planned at the losing DPC. Once non-recurring

costs are recouped, savings will begin to accrue. Non-recurring costs to reduce engine facilities is $11.5M. This expense is offset by the aircraft single site savings. In addition, the equivalent square footage of the excess engine facilities will be closed to eliminate unused capacity, or converted to other uses to reduce future MILCON requirements. NAVAIR engine single siting will result in depot support assignments as portrayed in Table 3-7.

Table 3-7
NAVAIR Engine Single Siting

ENGINE	BEFORE SINGLE SITING	AFTER SINGLE SITING	COMPLETION DATE
J52	Alameda/Jacksonville	Jacksonville	FY92
T56*	Norfolk/Alameda	Alameda	FY92
501K	Alameda	Alameda	
TF34	Alameda	Alameda	
F404	Jacksonville/North Island	Jacksonville	FY92
T58	North Island/Cherry Point	Cherry Point	FY92
T64	North Island	Cherry Point	FY94
F402	Cherry Point	Cherry Point	
J79	Cherry Point	Cherry Point	
T76	Cherry Point	Cherry Point	
T400	Cherry Point	Cherry Point	
LM2500	North Island	TBD	FY94

* A single public-private competition will be conducted to determine both the organic core depot and the organic or commercial depot that will provide above core depot maintenance.

3.3.1.4 Other Workload Consolidations

NAVAIR's strategy for near-term savings also includes consolidation of component, support equipment, and calibration workloads. Aircraft components are being consolidated at the depot offering the most efficient processes and the best value to the customer. Savings attributed to component consolidation will be credited to DMRD 919, Navy DMR Proposals, and the Aviation Supply Office (ASO). NAVAIR is also consolidating its depot level support equipment repair and calibration programs. A total savings of $17.6M is expected from these workload consolidations.

Table 3-8
Summary of NAVAIR Consolidation Cost Savings
($ in Millions)

FY91	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
0.6	2.6	2.8	2.9	2.9	2.9	2.9	17.6

The calibration laboratories consolidations are proceeding on schedule with workload transitions having begun in December 1991 and expected to conclude in November 1992. Managers are beginning to see lower overhead costs, reduced inventory levels, and fewer requirements for spare parts.

3.3.1.5 Integrated Program Support Offices (IPSO)

Another NAVAIR initiative will be the establishment of IPSOs at the NADEPs. IPSOs are self-contained cells that will have responsibility for engineering and logistics for groupings of similar equipment or technologies. NAVAIR's depot product line focus concentrates engineering and management talent in support of Headquarter's Program Managers - Air (PMA), and gives PMAs "cradle to grave" life cycle management responsibilities for assigned weapon systems. The IPSO is still in the conceptual phase and will be formally promulgated by NAVAIR instruction.

3.3.2 NAVAIR Long-Range Strategy

The NAVAIR long-range strategy savings projection is $1.0B, which includes $395.9M cut from the DMRD 908 baseline and $104.4M in FY91 savings. The initiatives being executed to achieve the long-range savings include increased interservicing, increased public-private competition, and increased capacity utilization. Individual long-range plans are detailed below.

3.3.2.1 NAVAIR Interservicing Implementation Plan

Through interservicing, NAVAIR projects an FY91-FY97 savings of $52.6M. These savings are expected through greater economies of scale via interservice workload consolidations to the gaining activity. Additionally, savings will be accrued by the NAVAIR losing activity through overhead reductions associated with facility downsizing and the elimination of underutilized depot capacity. NAVAIR projects a 20 percent price reduction for interserviced workload after non-recurring costs have been paid.

The initiatives identified in the FY91-FY95 DDMC CBP remain intact, though projected savings have been adjusted. The most significant FY91-FY95 adjustment to the NAVAIR projections was the decrease from $12.1M to $9.1M in the interservicing of its tactical missiles to LEAD, due to declining workloads and slippage of planned transition dates. However, greater savings from this initiative, and all other initiatives, will accrue through FY97.

Implementation plans have been prepared to transition the F110 engine to Oklahoma Air Logistics Center (OC-ALC), the TF30 engine to OC-ALC, the J79 engine to NADEP Cherry Point, the C-130 aircraft to Ogden Air Logistics Center (OO-ALC), and the F-4 aircraft from OO-ALC to NADEP Cherry Point.

3.3.2.2 NAVAIR Competition Implementation Plan

NAVAIR's projected competition savings is $555.9M, distributed through FY91-FY97. The NAVAIR competition strategy assumes that public-private competition applies to all eligible programs above core supported within the depot industrial base. The projected net competition savings are based on 20 percent of the baseline budgeted cost for first-time competed work, and 8 percent for recompetitions. NAVAIR is also pursuing other "non-traditional" workload competition opportunities such as modifications and component repair. ASO is also pursuing public-private competition for component repair, and projects savings of $25.6M in FY92 and a total savings of $158.5M through FY97. These savings are applicable to DMRD 919 and are not included in the NAVAIR competition savings.

Of the initial aircraft program competitions identified in the basic DDMC CBP, all but the A-4, T-2, S-3, and the H-3 remain viable. These aircraft programs dropped from the schedule due to a decrease in program funding in the outyears. These programs represented $32.4M in projected savings from FY91-FY95 in the original plan. In addition, the P-3 and E-2C aircraft competition programs are being reviewed to determine if budgeted repair quantities are sufficient to support competition. The T56 engine competition has also been adjusted to include the T56 Gearbox and will occur in FY93 with a projected savings of $18.3M. Several other competition candidates have been identified and include the QF-4N Conversion ($8.0M savings) and the T700 engine ($7.0M savings). (The timing of the NAVAIR QF-4N Drone Conversion competition program has been adjusted. Identified in the FY91-FY95 DDMC CBP as a joint Navy/Air Force competition to occur no earlier than FY98, NAVAIR has decided to compete its portion of the program in FY94. Any joint competition of the QF-4 Drone Conversion will be accomplished at a later date.) $64.2M of savings in FY91 resulted from previous public-private competition actions.

The A-6 rewing competition was completed prior to DMRD 908. Accordingly, additional guidance from the Navy Comptroller (NAVCOMP) since the issuance of the FY91-FY95 DDMC CBP resulted in deletion of the identified FY91-FY95 savings ($45.5M) for the project and an offsetting reduction ($45.5M) of the NAVAIR DMRD 908 FY91-FY95 target.

3.3.2.3 NAVAIR Implementation Plan to Improve Capacity Utilization

NAVAIR capacity utilization savings will accrue from process improvements and the resultant economies of scale, reduction of overhead, and return of unutilized depot space to the host activity. NAVAIR recognizes that continuous improvement of all processes is the means by which true long-term savings will be achieved. Since the 1980s, NADEPs have focused their efforts toward improving key processes, thereby improving upon capacity utilization. Concepts such as the Program Management Team Office (eliminating barriers between NADEPs using elements of Juran and Deming),

statistical process control (SPC), process improvement teams (PIT), Manufacturing Resource Planning (MRP II), Just In Time (JIT), and Total Quality Management (TQM), are integral parts of the process improvement program. Process improvements have resulted in reduction of MILCON projects and capital investments. In addition, NAVAIR expects process improvements to produce greater return on investments. Capacity utilization will be increased by divesting unneeded or inefficiently used resources, redistributing existing workloads within NAVAIR and among the Services, bringing contract workload to organic depots based on competition and lower costs, obtaining opportunity workloads in the manufacturing and fabrication areas, and improving processes for existing workloads. Increased economies of scale, reduction of overhead, closure of facilities, and reduction in MILCON and capital investments are projected to result in FY91-FY97 savings of $391.5M.

3.4 NAVAL SEA SYSTEMS COMMAND

The Naval Sea Systems Command (NAVSEA) strategy for achieving savings and increasing the efficiency of its depot activities and shipyards is embodied in the Navy near-term plan, 2 August 1990, the JSBP, and the Naval Shipyard Corporate Operations Strategy and Plan (COSP). The latter document was issued 30 May 1990 and revised and reissued as COSP, Revision 2, 31 October 1991. The COSP is designed to meet the savings goals of DMRDs 908, Ship Depot Maintenance; 919I, Naval Shipyard Productivity Efficiencies; and 939, Computer Aided Logistics Support (CALS). The COSP has been structured to reflect the current and projected business operating environment of the shipyards. The COSP contains three key issues and accompanying plans of action and milestones for achieving savings and improving operations and performance. The three key issues for NAVSEA are:

- Cost and Schedule Performance
- Technical Excellence and Human Resource Strategy
- Environmental Excellence and Occupational Safety/Health Enhancement

These issues have been identified as the key areas that need improvement to meet the NAVSEA strategic goals. Specific standards to address these target areas are delineated in the COSP and encompass required changes, target goals, and performance measures for assessing planned progress and improvements. NAVSEA is focusing on maintaining a high standard of quality by stressing continuous improvement as the catalyst to achieve activity ownership of long-term and lasting change. To assist in the central effort, NAVSEA is aggressively pursuing new tools and methods to enable the Navy to meet its current and emerging requirements. The means to accomplish this is the application of Total Quality Leadership (TQL) methodology, to change the way NAVSEA conducts business, e.g., new ways to improve the systems NAVSEA uses, and to manage work and people.

The NAVSEA strategy for managing the changing environment in the 1990's is to achieve depot maintenance savings goals while maintaining a responsive depot maintenance capability to support the Chief of Naval Operations (CNO) strategic objectives and mission requirements. NAVSEA's strategy is best characterized as a phased approach. It is designed to stabilize depot operations as force structure reductions occur and, in parallel, implement initiatives to improve the ship maintenance processes that influence cost and schedule duration. Table 3-9 summarizes the NAVSEA FY91 savings achieved, current savings projections, targets, and variances.

3.4.1 NAVSEA Near-Term Strategy

The NAVSEA near-term savings strategy is the reduction of the support burden related to force structure and workload reductions. NAVSEA has been pursuing a phased approach to restructure its shore activities by downsizing the direct and indirect workforce. The workforce reductions have been accomplished through Reductions in Force (RIF), attrition, and hiring of temporary and on-call employees, which ensures adequate flexibility is maintained to adjust for work mix fluctuations. To accommodate employees during this tumultuous effort, transition pools and job fairs were and will continue to be used. Downsizing of the naval shipyards began in earnest in FY91. The NAVSEA corporate approach will accomplish the downsizing in a standard manner, making allowances for unique characteristics of the individual shipyards. The downsizing to match reductions in the depot maintenance program will yield an estimated net savings of over $1.1B for the period FY91-FY95. Savings have been reflected in the customer accounts in the FY92-FY97 Navy Program Objective Memorandum (POM).

Naval shipyards also have recently reorganized to streamline the shipyards' support to reflect workload requirements and to concentrate on managing by project rather than product line. This action has led to the reduction of the indirect support structure of the shipyards and has resulted in balancing the workforce, i.e., the ratio of direct to indirect labor. Realignments will make the shipyards more responsive to customers and improve the management of and consumption of resources. Employment reductions will continue throughout FY92 to meet the reductions identified in the depot maintenance program.

Table 3-9
Summary of NAVSEA Projected Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Near-Term	97.9	175.4	227.7	293.0	383.7	1,177.7
Interservicing **	0.1	0.1	0.1	0.1	0.1	0.5
Competition	0.0	0.0	3.6	3.1	7.4	14.1
Capacity Utilization	1.0	14.5	21.6	35.8	70.8	143.7
Total	**99.0**	**190.0**	**253.0**	**332.0**	**462.0**	**1,336.0**
Target	**99.0**	**190.0**	**253.0**	**332.0**	**462.0**	**1,336.0**
Variance	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

* FY91 column reflects savings achieved.
** Includes SPAWAR ground communication and electronics.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Near-Term	1,177.7	330.4	247.1	1,755.2
Interservicing	0.5	0.1	0.1	0.7
Competition	14.1	20.2	35.5	69.8
Capacity Utilization	143.7	69.3	69.3	282.3
Total	**1,336.0**	**420.0**	**352.0**	**2,108.0**
Target	**1,336.0**	**420.0**	**352.0**	**2,108.0**
Variance	**0.0**	**0.0**	**0.0**	**0.0**

3.4.2 NAVSEA Long-Range Strategy

The NAVSEA long-range strategy is to increase interservicing and capacity utilization, and to heighten competition in executing ship depot level maintenance. The savings from this combination of long-range actions, will result in savings of approximately $352.8M for FY91-FY97.

NAVSEA is formulating a transition plan to address the downsizing of existing depot capacity. This plan will target increasing the utilization of capacity by eliminating capacity no longer needed, e.g., excess facilities, obsolete machinery in use, drydocks no longer

usable due to size constraints. Increased interservicing is expected to contribute to savings by reducing redundant, repetitive tasks among the Services through consolidation of effort. Competition savings will be increased by offering work not normally competed between the private and public sectors.

In addition to the savings accruing through increased interservicing, competition, and capacity utilization, a combination of NAVSEA initiatives to achieve process improvements, consolidations, and efficiency gains over the long term are being pursued through the COSP. One of the ongoing developments that will result in signficant savings, which will apply to DMRDs 919 and 939, is the development and implementation of the Advanced Industrial Management (AIM) Program. AIM will improve naval shipyards' performance through:

- Improved Work Planning, Estimating, and Scheduling Process
- Application of Group and Zone Technology
- Automation Improvement through Data Integration and Control
- Organizational Changes to take Advantage of the Improved Processes

As much as AIM is an engineered process improvement for industrial operation, and a major COSP initiative, it will also integrate current approved initiatives applicable to DMRD 939 such as Engineering Drawing Management Information Control System (EDMICS), Supervisor's Desk (SUPDESK), Computer Aided Design 2 (CAD2), and Local Area Networks (LAN). Through improved NAVSEA processes will come synergistic benefits to the entire spectrum of the acquisition and logistics management. Process efficiencies will reduce the industrial effort required to accomplish depot level repair, and will result in decreasing costs to the customer.

3.5 AIR FORCE

The Air Force strategy is derived from its near-term plan, 30 July 1990; the JSBP; and the Air Force Depot Maintenance Business Plan, 26 April 1991. The strategy contained in the latter document remains unchanged, but the actions to achieve the strategy have been updated to reflect the current projections for achieving the Air Force DMRD 908 savings. Table 3-10 summarizes savings, DMRD 908 targets and variances for the Air Force.

Table 3-10
Summary of Air Force Projected Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Near-Term	44.2	68.0	105.0	109.0	109.0	435.2
Interservicing	0.0	1.7	11.6	13.0	13.5	39.8
Competition	14.1	68.8	110.5	176.6	241.7	611.7
Capacity Utilization	0.1	10.8	8.4	1.2	3.2	23.7
Total	**58.4**	**149.3**	**235.5**	**299.8**	**367.4**	**1,110.4**
Target	**5.9**	**149.3**	**235.5**	**309.1**	**410.6**	**1,110.4**
Variance	**+52.5**	**0.0**	**0.0**	**-9.3**	**-43.2**	**0.0**

* FY91 column reflects savings achieved.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Near-Term	435.2	112.7	116.5	664.4
Interservicing	39.8	14.6	15.6	70.0
Competition	611.7	162.0	169.6	943.3
Capacity Utilization	23.7	3.4	3.5	30.6
Total	**1,110.4**	**292.7**	**305.2**	**1,708.3**
Target	**1,110.4**	**292.7**	**305.2**	**1,708.3**
Variance	**0.0**	**0.0**	**0.0**	**0.0**

3.5.1 Air Force Near-Term Strategy

The Air Force Near-Term Plan, 30 July 1990, called for the reduction of the Air Force programmed depot maintenance costs between FY91 and FY95. This period has been extended to FY97 with total projected savings of $664.4M.

No Air Force near-term savings were originally planned for FY91 because all efforts were directed towards preventing a loss to the Depot Maintenance Industrial Fund (DMIF) in FY91. However, due to aggressive actions, not only was a loss prevented but profit was realized. This profit was due, in part, to cost reductions in areas identified in the Near-Term Plan. The profit will help to balance the DMIF Accumulated Operating Result (AOR) by FY93. This early success means the Air Force achieved savings earlier than planned. The FY92-FY95 projected Air Force near-term savings remain the same as first identified. The FY96-FY97 Air Force near-term savings projections are an extension of the FY95 level of savings.

The Air Force near-term plan called for personnel reductions, installation closure, streamlining, and process improvements. As shown in the following paragraphs, many of these actions have been initiated and in some cases completed. For example, based on force structure projections, streamlining of operations, and productivity improvements, Air Force Materiel Command (AFMC) developed a five-year plan to structure Air Force depots to provide continuing support to its customers and achieve maximum savings while creating minimum disruption of the work force. FY91-FY97 savings associated with this action are $274.3M.

Part of the five-year plan was a reduction of the Air Force DMIF work force of over 6,000 people in mid FY91. This was realized through a combination of actions--early out, RIF, and normal attrition. A hiring freeze is expected to continue, with only limited DMIF hiring of individuals with critical skills for mission essential workloads. The five-year plan will be reviewed and validated to ensure that when workload increases or decreases occur, any capability or needed workforce adjustments will be implemented.

Other near-term actions include the closure of Support Group Europe (SGE) at RAF Kemble, improving material management, reducing equipment/supplies, and reducing Contractor Engineering Technical Services (CETS). The closure of SGE is proceeding as planned with the forward stockage and organic depot maintenance functions being terminated on 1 January 1992 and 31 March 1992, respectively. Depot maintenance is being returned to the CONUS source of repair. In-theater contractors are being evaluated as potential repair sources when deemed cost effective or mission critical. United States Air Force Europe (USAFE) base stock levels have been increased on critical items to offset the loss of forward stockage. Withdrawal of other SGE functions was completed by August 1992. The FY91-FY97 savings from closure of SGE are $73.5M.

Material management improvement is being accomplished by converting all targeted Maintenance Inventory Centers (MIC) to Depot Maintenance Support Centers (DMSC). This effort is expected to provide $119.1M of savings through FY97. Each DMSC will store and issue forward stocked material directly from the Air Force Stock Fund instead of holding inventory in the Air Force Industrial Fund. This will avoid duplicate inventories on the same depot as well as minimize accounting and inventory adjustments

Contractor Engineering Technical Services are DOD contractors who provide training and guidance to DOD personnel for new or upgraded systems. CETS personnel conduct training within a unit to increase the technical qualification of DOD assigned personnel. Through improved training of maintenance technicians under the Human Resources Development Program, reliance on CETS support can be reduced. CETS have been reduced from the 54 CETS personnel used in FY90 to 15 CETS contractors in FY93.

Process improvements are also an important element of the Air Force near-term strategy. As part of the effort to improve processes, each Air Logistics Center has reorganized into product directorates and is structured to better meet customer needs using TQM philosophies. Emphasis is centered on improved processes in every aspect of depot maintenance operation. These process improvements are designed to reduce supply and equipment requirements of the depots by an estimated 25 percent. The Air Force's FY91 experience shows these changes have in fact taken place.

3.5.2 Air Force Long-Range Strategy

The Air Force continues with its long-range strategy of achieving savings through interservicing, competition, and increased capacity utilization, with the majority of its savings coming from competition.

3.5.2.1 Air Force Interservicing Strategy

The goal of the Air Force is to reduce the cost of accomplishing depot maintenance through increased interservicing. The projected FY91-FY97 interservicing savings for the Air Force are $70.0M. Significant FY91-FY97 interservicing savings for the Air Force include Air Force F-4 workload transfer to NADEP Cherry Point ($6.4M), Air Force J79 engine workload transfer to NADEP Cherry Point ($6.7M), tactical missile interservicing to LEAD ($19.4M), and economies of scale resulting from the Navy TF30 and F110 engines being interserviced to OC-ALC ($37.5M).

The projected economies of scale savings associated with the latter initiative are provided when overhead costs are spread over a larger workload base. The transfer of the Navy TF30 engine workload from NADEP Norfolk to OC-ALC is scheduled to transition 30 December 1992. The Navy F110 engine workload transfer from NADEP Norfolk to OC-ALC is scheduled to transition 30 September 1993.

The transfer of the J79 engine workload from OC-ALC to NADEP Cherry Point has been completed. The projected J79 workload has dropped significantly since the engine commodity study was completed due to force structure reductions. The F-4 airframe workload transfer from OO-ALC to NADEP Cherry Point is not on the original schedule and is now targeted for the first quarter FY93. The projected workload for this interservicing action has increased since the completion of the fixed-wing aircraft commodity study due to an increase in Foreign Military Sales (FMS) workload.

The tactical missile interservicing action is proceeding. The Air Force Sparrow missile workload, currently interserviced at NADEP Alameda, is on schedule to transfer to LEAD during the third quarter of FY93. The Air Force Sidewinder workload, currently accomplished at OO-ALC, is on schedule to transfer to LEAD during the fourth quarter FY93. The Air Force Maverick missile workload scheduled transfer from OO-ALC to LEAD has slipped to the third quarter FY96.

Other interservicing actions with lesser individual associated savings are being pursued. These include the small arms workload transfer from OO-ALC to ANAD, which is complete; the Navy C-130 landing gear workload to OO-ALC; the prototype effort of the Navy F-14 landing gear to OO-ALC; and Army ground support GTE's to SA-ALC.

3.5.2.2 Air Force Competition Strategy

Competition remains the primary source of expected Air Force FY91-FY97 savings and totals $943.3M. This includes public-private competition, public-public competition, and manufacturing competition. The Air Force strategy is to compete at least one workload within each center's assigned commodity/technology groups during FY91-FY95 and apply the lessons learned to other workloads in that group. In addition each center will put at risk, i.e., compete, some of its organic workload by the end of FY95. In preparation for competition, the Air Force has reduced its industrially funded workforce in order to make its depots more competitive. This will result in a savings of $287.5M. Public-private competitions will result in savings of $598.0M, public-public competitions will add an additional $45.8M, and manufacturing competition will contribute $12.0M.

FY91 competition savings were $14.1M, an increase from the original projection of $4.9M. The revised total reflects the net result of savings gained through manpower reductions and a net cost for the FY91 prototype competitions due to the one time costs associated with starting competitions. Future savings projections for competition will more than offset the initial prototype cost.

The Air Force projected competition savings differ from the initial DDMC CBP. Table 3-11 provides a summary of Air Force adjustments to its initial list of FY92 competition candidates. The adjustments are attributable to the visibility gained from the actual FY91 competitions; changes to the list of FY92 candidates caused by force structure reductions, e.g., B-52G phasedown; manpower reductions; and lessons learned (lessons learned savings result from applying efficiencies gained from specific competitions to other programs). The FY91-FY95 decrease in projected savings from $642M to $607M is offset by increases in FY91 near-term savings and manpower reductions. The greatest variance occurs in FY95 (-$38.4M). Projected FY91-FY95 savings from manufacturing competitions have decreased from $52M to $8M based on experience gained in FY91. The decrease is offset by increases in public-private competitions and the associated lessons learned savings.

The Air Force has more clearly defined its competition programs for FY93 as well. The Air Force proposed FY93 competition candidates (see Table 5-4) are expected to result in FY93-FY97 savings of $173.9M. Details of these savings are provided within the FY92 Air Force Business Plan Update and the Secretariat Implementation Tracking System (SITS).

Table 3-11
Air Force Adjustments to FY92 Competition Program

Candidate	Action
KC-135 IFR Boom	Moved to FY93 candidate
J57 Engine	Deleted, lack of requirements (B-52G phasedown)
F-16 Air Pressure Regulator Valve	Deleted, not representative of OO-ALC competition plan
Minuteman III Gyro	Deleted, competition will be limited to private-private at discretion of System Program Manager (SPM)
Refurb Silos at Vandenburg	Deleted, not representative of OO-ALC competition plan
Miscellaneous Aircraft Wheels	Moved to FY93 candidate
APQ-172 Radar Pod	Deleted, decline of requirements (F-4 phasedown)
CSD Transmissions	Added as FY92 candidate
F-16 APG-68 Radar	Added as FY92 candidate
Assorted Landing Gear	Added as FY92 candidate
Ground C-E	Deleted as FY92 candidate due to SM-ALC involvement in SAAD competition
100/200KW Generators	Deleted as FY92 candidate due to SM-ALC involvement in SAAD competition

3.5.2.3 Air Force Capacity Utilization Strategy

The Air Force strategy continues to emphasize depot downsizing. This entails divesting or mothballing unneeded facilities and equipment when it is cost effective and does not impact mobilization capability or future workload requirements. Accordingly, equipment and facility utilization will continue to be analyzed in relation to current and projected workloads and reserve capacity requirements. Air Force actions to increase capacity utilization are projected to achieve savings of $30.6M for FY91-FY97. Detailed center plans are being implemented to achieve projected savings through reductions in equipment buys and other divestitures.

Projected Air Force equipment savings will be realized through workload consolidations and process improvements (Industrial Process Improvement Program). Industrial Plant Equipment savings are estimated based on the reduced flying hour program and the reduced maintenance workload hours. Centers will be able to accomplish their mission by using equipment from other facilities or by requiring less equipment based on new workload projections and/or process improvements.

In FY92, equipment reduction savings of $5.6M will accrue through the cancellation of procurement requests for one thread grinder, one five-axis milling machine, one material analyzer, and one compressor. Equipment reductions in FY93 of one fluid cell press, one drop hammer mill, and an image digitizer are expected to save $2.7M.

Air Force capacity utilization savings achieved for FY91 were $0.1M. The reduction from the projected $1.0M savings is attributed to the projected beneficial occupancy date slippage of the new Integrated Structural Repair Overhaul and Maintenance System (ISROMS) facility at OO-ALC. Move-in is projected to occur during the first quarter of FY93. Consolidation of operations in the ISROMS facility will create capacity savings through elimination of aged buildings and equipment.

3.6 MARINE CORPS

The Marine Corps business strategy is documented in the Marine Corps Maintenance Corporate Business Plan, 21 April 1992. The plan presents the Marine Corps strategy to reduce the cost of depot maintenance by $28.1 over the period FY91-FY97. In implementing this strategy, the Marine Corps operates under the following constraints:

- Industry has access to the DOD supply system. This allows industry to choose between a private vendor and DOD for the best price. DOD activities are required to use the DOD supply system and do not have the flexibility that industry has. This creates an unlevel playing field with the advantage of price and lead time to industry.

- MILCON projects are funded separately from other requirements. The timeliness of funding for these projects is inadequate for competition. The requirement far exceeds the receipt of the resources.

- The large variety of ongoing programs and the relatively small capacity of the Marine Corps Depot Maintenance Activities (DMA) compared to the other Service depots and commercial depots tend to put the Marine Corps at a competitive disadvantage.

- The Marine Corps uses the Inspect and Repair Only as Necessary (IROAN) maintenance philosophy. The IROAN program is cost effective, but can be difficult to bid as a fixed price contract. The inability to compete weapon systems on a fixed price basis can limit the opportunity for savings.

Table 3-12 shows Marine Corps savings projections for the period FY91-FY97, as well as the DMRD 908 savings target and variances from the target. The baseline for projecting savings is the FY91 amended budget submitted to Congress in January 1990 for the Operations and Maintenance Appropriation Equipment Maintenance Program. FY91 savings achieved are based on the two programs competed as part of the FY91 Competition Demonstration Program (AN/TPB-1D Radar Set and M923 5-Ton Truck).

Table 3-12
Summary of Marine Corps Projected Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY91-FY95 SUBTOTAL
Near-Term	0.0	(27.0)**	0.0	0.0	0.0	0.0
Interservicing	0.0	0.2	0.3	0.5	0.6	1.6
Competition	0.3	0.4	2.0	4.0	6.0	12.7
Capacity Utilization	0.1	0.1	0.1	0.1	0.0	0.4
Total	**0.4**	**0.7**	**2.4**	**4.6**	**6.6**	**14.7**
Target	**0.2**	**0.5**	**2.6**	**4.7**	**6.7**	**14.7**
Variance	**+0.2**	**+0.2**	**-0.2**	**-0.1**	**-0.1**	**0.0**

* FY91 column reflects savings achieved.
** Memo entry: Cost avoidance--M1 Tank project planned but not included in the POM.

	FY91-95 SUBTOTAL	FY96	FY97	TOTAL
Near-Term	0.0	0.0	0.0	0.0
Interservicing	1.6	0.0	0.0	1.6
Competition	12.7	6.7	6.7	26.1
Capacity Utilization	0.4	0.0	0.0	0.4
Total	**14.7**	**6.7**	**6.7**	**28.1**
Target	**14.7**	**6.7**	**6.7**	**28.1**
Variance	**0.0**	**0.0**	**0.0**	**0.0**

3.6.1 Marine Corps Near-Term Strategy

The Marine Corps near-term strategy entails cancellation of the M1 Tank facilitization at Marine Corps Logistics Base Barstow. This action affords a cost avoidance of $27M.

3.6.2 Marine Corps Long-Range Strategy

The strategy to achieve long-range savings is based on three interdependent functions: an increase in interservicing of depot maintenance workloads where cost savings can be achieved, an optimal utilization of depot capacity that ensures efficiency and provides for the infrastructure necessary to meet peacetime and contingency needs,

and the implementation of a comprehensive public-private and public-public competition program for depot maintenance workloads.

3.6.2.1 Marine Corps Interservicing Strategy

Marine Corps interservicing savings will be generated by two actions. The first is interservicing of 5-ton truck workload to TEAD during FY92. This action was taken as a result of the award of the M-923 5-Ton Truck workload to TEAD in the FY91 Competition Demonstration Program. In the wake of that award, the Marine Corps determined that further savings could be achieved through the interservicing of additional FY92 5-ton truck workload to TEAD. This action will also reduce the potential for a large workload carry-over as a result of the influx of Desert Storm workload. Other Marine Corps interservicing savings will be realized through the transfer of Hawk Missile workload from contract to LEAD.

3.6.2.2 Marine Corps Competition Strategy

Competition represents the most aggressive portion of the Marine Corps strategy, with a projected savings of $26.1M. The major area for competition savings is that of weapon systems competition. Other areas of opportunity in competition will be analyzed as additional sources of savings to supplement or replace the weapon system candidates. Major modification and refurbishment programs will be evaluated for their competition potential. Current contracts will be reviewed for possible competition candidates where available technical data permits. Three competition programs have been added to those shown in the basic DDMC CBP. These include the AAV-P7A1 Block II Upgrade and Refurbishment Program, the 5-Ton Series Trucks, and the Logistics Vehicle System (LVS). Also, the planned competition for the M998 Truck has been accelerated from FY94 to FY92 due to increased availability of assets and Desert Storm funding. The Marine Corps will maximize the process of generating savings. Efficiencies realized from competition of above core requirements will be applied to core requirements. Efficiencies gained at a competing depot will be applied to the non-competition depot in those instances where a weapon system common to both depots is competed. All FY92 Marine Corps competition programs are on schedule to be awarded during August and September 1992.

3.6.2.3 Marine Corps Capacity Utilization Strategy

The Marine Corps DMAs will operate at a higher than normal capacity utilization rate during the FY92-FY94 period because of the extensive use of overtime and temporary employees to execute Desert Storm workload. Given these projections of high utilization, opportunities for capacity utilization savings are limited. The total Marine Corps FY91-FY97 capacity utilization savings is $0.4M. This includes $0.05M savings in FY91 due to two initiatives at MCLB Barstow--depot repair of a Hawk Missile harness vice purchase, and automating material issues in support of production lines. In spite of the relatively low potential for capacity utilization savings, the Marine Corps will continue to

apply TQL principles maximizing efficiency and productivity to increase its capacity utilization level to the maximum extent possible. The Marine Corps strategy to improve depot productivity includes:

- Streamlining/improving depot processes
- Expanding the IROAN program to additional weapon systems
- Installing an automated parts retrieval system to reduce materiel expenses and direct labor costs
- Installing the Automated Production Control System (APCS) to enhance financial analysis, production scheduling, workload forecasting, and capacity analysis.

To enhance its competitive posture, the Marine Corps plans to install APCS at both depots during FY92 using commercially available software. Implementation will be completed in FY93. The APCS will provide enhanced labor, material and financial visibility, and competitive bid costing. It will improve and link repair scheduling and parts inventory management through the use of the following functional modules: work in progress, defect tracing, production planning and scheduling, workload forecasting, and capacity analysis. Benefits to be realized from APCS include reduction in inventory costs, faster parts routing, and real-time management information. It is anticipated that a decrease in indirect personnel costs will be realized upon full implementation of the APCS.

This depot optimization process will not remove the requirement to maintain a reserve capacity to meet military core requirements and potential workload won through successful competition. Also, it is necessary to retain reserve capacity to meet unexpected workload fluctuations and mobilization requirements to enable immediate responsiveness during national emergencies short of wartime, such as Operations Desert Shield and Just Cause.

3.7 INDUSTRIAL PLANT EQUIPMENT (IPE)

The Assistant Secretary of Defense (Production and Logistics) (ASD(P&L)) has determined that DLA is the Consolidated Material Manager for Federal Stock Group 34, which includes IPE, and the single source of IPE depot maintenance for all DOD. Accordingly, the IPE depot maintenance capability is being eliminated at SEAD and the Army IPE workload transferred to DLA. DLA has been performing IPE depot maintenance, and other technical IPE support services, for the Army, Navy, Air Force, and Marine Corps. As a result, more cost effective IPE depot level maintenance will be accomplished at DLA's Stockton, CA, and Mechanicsburg, PA, sites and/or by contract

under the consolidated material management of the Defense General Supply Center at Richmond, VA. Table 3-13 provides a summary of estimated Service savings associated with the IPE workload consolidation.

Table 3-13
Summary of Estimated Industrial Plant Equipment Cost Savings *
($ in Millions)

	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
Army	-2.8	2.6	2.7	2.8	2.9	2.9	11.0
NAVAIR	0.2	0.2	0.2	0.2	0.2	0.2	1.5
NAVSEA	1.4	1.4	1.4	1.4	1.4	1.4	8.3
Air Force	0.3	0.3	0.3	0.3	0.3	0.3	1.6
TOTAL	-0.9	4.5	4.6	4.7	4.7	4.8	22.3

* These estimated savings are undergoing validation by the Services and DLA.

CHAPTER 4

INTERSERVICING

4.1 INTRODUCTION

The Department of Defense depot maintenance policy emphasizes aggressive use of interservice maintenance support whenever increased economy to the Government will result and when such support is consistent with operational requirements. Under the current Depot Maintenance Interservice (DMI) Program concept, the Military Services individually and jointly are exercising maximum use of interservice capabilities to comply with this policy. Interservicing actions identified in the FY91-FY95 DDMC CBP as a result of the DDMC commodity studies conducted in 1990 - 1991 are a major part of the effort. The successful completion of workload transitions derived from the commodity studies combined with other interservicing efforts such as new start assignments, will enhance more efficient use of existing depot facilities, eliminate unnecessary capacity and capability, and lower costs to the Government through economies of scale and other efficiencies.

4.2 PROJECTED SAVINGS

The overriding objective of increased interservicing is to perform workloads within the cost, quality, and scheduled requirements of the Principal Service. Interservicing savings are being accrued from greater economies of scale through consolidations which reduce recurring costs to the gaining depot. The losing activity realizes savings through overhead reductions associated with reduced workload and downsizing its facilities to eliminate underutilized capacity. The FY91-FY97 interservicing savings forecast is $133.8M. Table 4-1 shows interservicing savings projected by the individual Services. Due to rounding, figures may not add exactly.

Table 4-1
Projected Interservice Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
Army	0.0	0.0	0.5	1.4	1.9	2.5	2.6	8.9
NAVAIR	0.0	0.0	10.9	9.4	10.8	10.6	10.9	52.6
NAVSEA **	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.7
Air Force	0.0	1.7	11.6	13.0	13.5	14.6	15.6	70.0
Marine Corps	0.0	0.2	0.3	0.5	0.6	0.0	0.0	1.6
Total	**0.1**	**2.0**	**23.4**	**24.4**	**26.9**	**27.8**	**29.2**	**133.8**

* FY91 column reflects savings achieved.

** Includes SPAWAR ground communication and electronics.

4.3 CURRENT INTERSERVICING LEVELS

4.3.1 Methodology to Measure Interservicing

DODD 4151.1 defines "Interservice maintenance support" as maintenance either recurring or non-recurring, performed by the organic capability of one Military Service or element thereof in support of another military Service or element thereof." This traditional concept of interservicing is, however, only one portion of the total DMI Program. DMI Program Workload performed at DOD installations and commercial contractors which is associated with interservice support (i.e., work performed under depot maintenance interservice support agreements, depot maintenance work managed under the nonconsumable item material support exchange program, and work performed under joint depot maintenance contracts). The definitions of the various DMI Program Workload elements are as follows:

Interservice: Maintenance, either recurring or nonrecurring, performed by the organic capability of one military Service/Defense Logistics Agency (DLA) or element thereof in support of another military Service/DLA or element thereof.

Other Interservice: Maintenance performed by the organic capability of one military Service/DLA or element thereof, or maintenance performed by a commercial firm pursuant to a contract negotiated by one of the military Services/DLA in support of other DOD agencies other than military Services/DLA such as the Defense Security Assistance Agency and the Defense Intelligence Agency.

Joint Service (JS) Contract: Maintenance performed by a commercial firm for a military Service/DLA or element thereof, pursuant to a contract negotiated by another military Service/DLA. (This category includes the joint Contractor Field Team (CFT) program, administered at Wright-Patterson AFB, OH.)

Nonconsumable Item Materiel Support Code (NIMSC) 5: Logistics support for recoverable items used by two or more military Services whereby the military Service which is the Primary Inventory Control Activity (PICA) is responsible for all logistics functions including depot maintenance. To obtain maintenance support for these items, military Services that are Secondary Inventory Control Activities (SICA) submit funded requisitions for their supply requirements, and return unserviceable items to the PICA for credit. The PICA, in turn, obtains depot maintenance, either organically, or contractually, for the unserviceable items and returns them to stock for reissue.

Two concepts are used in the computation of the interservicing level, non-susceptible workload and susceptible workload. The definitions of these concepts are:

Non-susceptible Workload: Workload that, due to requirements for specialized resources, does not lend itself to interservicing. These specialized resources include drydocks, large hangars, nuclear facilities, and large missile handling capabilities. Such resources reside in only one Service, and associated workloads cannot be considered for interservicing. This approach excludes workloads such as strategic bomber airframes (B-1, B-2, B-52), large transport airframes (C-5, C-135, C-141), Navy ships, and specific strategic missile workloads (Minuteman, Peacekeeper, Trident).

Susceptible Workload: Workload that is other than non-susceptible

For computation of the interservicing level, the susceptible workload level is determined by subtracting the non-susceptible workload from the total workload. The percentage of interservice workload is then determined by summing the DMI Program Workload elements identified above, and dividing this total by the total DOD workload base that is susceptible to interservicing.

4.3.2 Interservicing Data

The FY90 and FY91 DMI Program Workloads have been quantified under this approach and are shown on Charts 4-1 and 4-2, respectively. As seen in Chart 4-1, the FY90 DMI Program Workload is about 6 percent of the FY90 DOD program that is susceptible to interservicing. This is down 0.3 percent from the 6.3 percent for FY89 reflected in the FY91-FY95 DDMC CBP. It must be noted, however, that this total does not reflect the impact of interservicing decisions published in the FY91-FY95 DDMC CBP. As shown on Chart 4-2, the FY91 DMI Program Workload is seven percent of the FY91 DOD program that is susceptible to interservicing, and reflects a one percent increase from FY90. Chart 4-1 and 4-2 reflect data from the DOD 7220.9-M database. FY91 is the most recent year for which completed workload data are available. Since 7220.9-M data reflects only financial completions reported during a particular fiscal year, the impact of DDMC CBP decisions will not be evident in the database for some time to come.

Implementation of DDMC CBP interservicing decisions continues on schedule. For example, workload for the Army Bridge Loader Transporter has been transferred from Tooele Army Depot (TEAD) to Marine Corps Logistics Base Barstow. Air Force small arms workload has been transferred from Ogden Air Logistics Center to Anniston Army Depot. The advent of public-private competition is a boost for interservicing, as reflected by the award of Marine Corps M923 5 Ton Truck workload to TEAD. As a result of this award, the Marine Corps is interservicing additional 5 ton truck workload to TEAD during FY92.

Chart 4-1
FY90 Completed Depot Maintenance Workloads

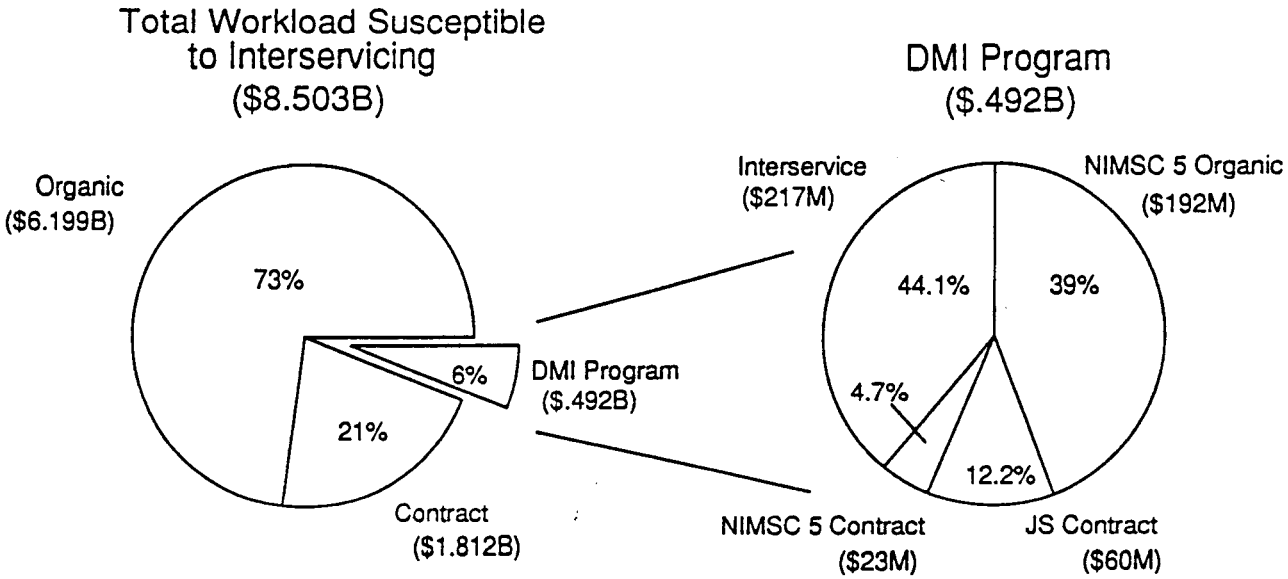
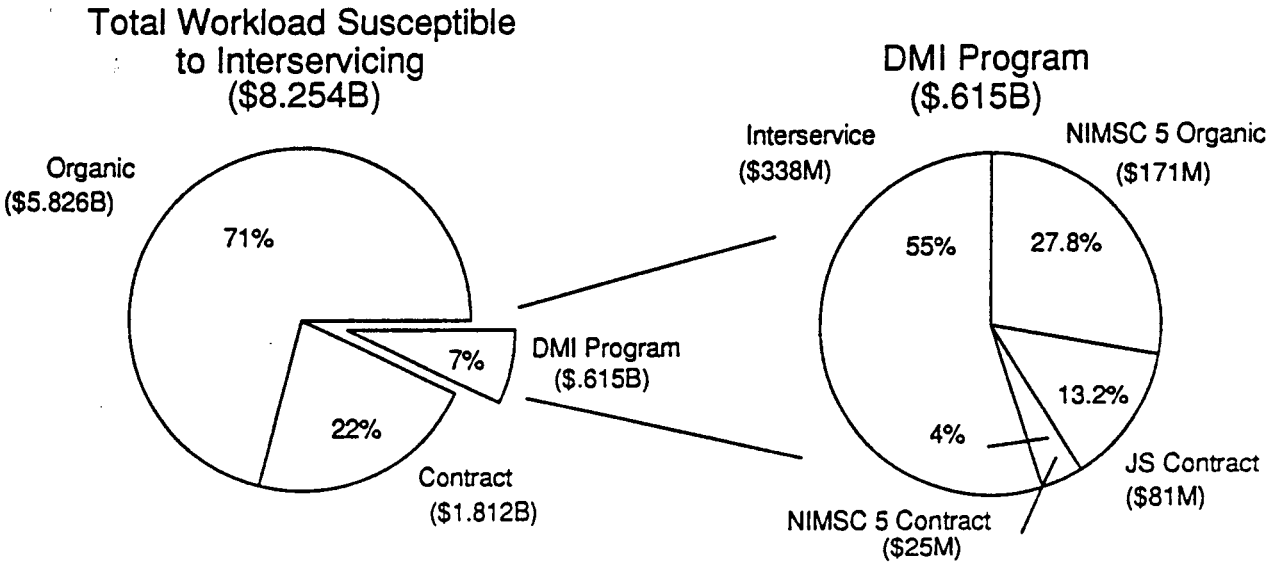


Chart 4-2
FY91 Completed Depot Maintenance Workloads



Primary Source: DoD 7220.9-M Data Base. Also includes additive for Contractor Field Teams.

CHAPTER 5

DEPOT MAINTENANCE COMPETITION

5.1 BACKGROUND

Competition is the largest single source of DMRD 908 long-range savings, comprising nearly 55 percent of the total long-range savings projection. To manage depot participation in competition, each Service has established a corporate structure and a business office. Table 5-1 portrays current projected competition savings by Service. Due to rounding, figures may not add exactly.

Table 5-1
Projected Competition Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
Army	-1.5	7.2	15.0	23.0	31.0	28.0	36.0	138.7
NAVAIR	64.2	57.8	111.0	134.5	135.6	24.6	28.2	555.9
NAVSEA	0.0	0.0	3.6	3.1	7.4	20.2	35.5	69.8
Air Force	14.1	68.8	110.5	176.6	241.7	162.0	169.6	943.3
Marine Corps	0.3	0.4	2.0	4.0	6.0	6.7	6.7	26.1
TOTAL	**77.1**	**134.2**	**242.1**	**341.2**	**421.7**	**241.5**	**276.0**	**1,733.8**

* FY91 column reflects savings achieved.

The depot maintenance competition program, which includes competition on a public-public, public-private, and private-private basis, is carried out under various legislative authorities. The following govern competition:

- Section 352 of the National Defense Authorization Act for Fiscal Year 1993 amends Section 2466 of Title 10, United States Code, to include two provisions. The first requires that the Secretary of a military department and, with respect to a Defense Agency, the Secretary of Defense, may not contract for the performance by non-Federal Government personnel of more than 40 percent of the depot-level maintenance workload for the military department or the Defense Agency. The second provision requires that the Secretary of the Army shall provide for the performance by employees of the Department of Defense of not less than the following percentages of Army aviation depot-level maintenance workload:

  a. For fiscal year 1993, 50 percent.
  b. For fiscal year 1994, 55 percent.
  c. For fiscal year 1995, 60 percent.

- Section 9095 of the Defense Appropriation Act for FY93 states that, notwithstanding any other provision of law, the Secretary of Defense may acquire the modification, depot maintenance and repair of aircraft, vehicles and vessels as well as the production of components and other Defense-related articles, through competition between Department of Defense depot maintenance activities and private firms.

- Section 381 of the FY93 Authorization Act states that naval shipyards and Army, Navy, and Air Force aviation depots may compete for production of defense-related articles and the provision of Services related to defense programs.

The FY93 competition program will be conducted under this legislative authority. Previous legislative authority had authorized the Army, Air Force and Marine Corps to conduct a Competition Demonstration Program during FY91-FY92. Navy ship depot maintenance was not part of the demonstration program, since the amount of ship work currently competed at that time exceeded the program scope. Because of its well established, viable competition program, NAVAIR did not participate, but competed workload on a continuing basis.

The Defense Logistics Agency (DLA) is also developing competition procedures to utilize the Services' organic depot maintenance activities as a source of supply for certain DLA managed items. These procedures will permit the depot maintenance activities to compete for selected supply items for which they have production capability and capacity.

5.2 FY91 COMPETITION DEMONSTRATION PROGRAM RESULTS

The FY91 competition demonstration program permitted the Army, Air Force, and Marine Corps to engage in public-private competition for the first time. Each Service competed selected depot maintenance workloads and designated one depot to compete for each workload. All solicitations were open to public and private bidders, and as a result, some competitions involved private bidders as well as public bidders from more than one Service. Table 5-2 displays the results of these competitions, including projected savings resulting from the awards. As can be seen, organic depots did very well, winning eight of the total fourteen awards. There was one interservice award, with Tooele Army Depot winning the Marine Corps 5 Ton Truck workload. Six awards went to commercial firms.

Table 5-2
Depot Maintenance Competition FY91 Pilot Program Results

WORKLOAD	PRE-AWARD SOR	AWARD WINNER	FY91-97 SAVINGS ($M)
Army			
T63-700 ENGINE	CCAD	CCAD	3.13
PATRIOT LAUNCH STATION	LEAD	LEAD	-0.09
M113 ENGINE	RRAD	Detroit Diesel	0.42
M44 1-1/2 TON ENGINE	TEAD	TEAD	0.36
MILVANS	ANAD	Genco	-0.03
AN/TPQ-36-37	SAAD	SAAD	-0.38
RT-524	TOAD	TOAD	1.49
Air Force			
G-5615 GEARBOX	SA-ALC	Standard Aero	6.40
F-16 SOFTWARE IV&V	OO-ALC	Logicon	0.70
TF33 VANES & SHROUDS	Contract	Chromalloy	1.30
AN/TRC-97A	SM-ALC	SM-ALC	0.70
AN/ARC-186 UHF	WR-ALC	WR-ALC	1.70
Marine Corps			
M923 5 TON TRUCK	MCLBB	TEAD	6.89
AN/TPB-1D	MCLBA	Loral	0.17

Since this was the first experience in public-private competition for the Army, Air Force and Marine Corps depots, the FY91 demonstration program was a valuable learning experience. Among the significant lessons learned were:

- Statements of Work (SOW) should be developed as far as possible in advance of the planned year of work to avoid having to accomplish the competition work as carry-over. Timely execution of the SOW and solicitation milestones permit more time during the evaluation phase.

- Cost Comparability Handbook application proved to be difficult. Guidance on calculating comparability factors on adjustments is not stipulated in the handbook. Joint service training for all personnel who use the handbook (e.g., contracting officers, depot bid teams, auditors, cost evaluation teams) is being conducted to increase common understanding of cost comparability.

- The Depot Maintenance Inter-Service Support Agreement (DMISA) should be the administrative vehicle to manage a workload competitively awarded to

another Service. Clarification is needed on the extent of DMISA development to incorporate the solicitation terms and conditions.

- Requests for Proposals (RFPs) must contain all terms and conditions applicable to both public and private offerors. The RFP may consist of a single document which includes all clauses applicable to public and private offerors with appropriate annotation specifying those clauses that do not apply to public offerors. It may also consist of two separate documents, one that applies to the private offerors and one that applies to the public offerors. In addition, the statement of work should be written in language that can be clearly understood. Contracting officers should be included on proposal development teams to facilitate understanding of and compliance with the solicitation.

5.3 FY92 COMPETITION PROGRAM

Table 5-3 lists the competition programs the the Services are conducting during FY92.

Table 5-3
FY92 Competition Programs

ITEM	CURRENT SOR	ANNUAL WORKLOAD VALUE ($ MILLIONS)
Army		
T700 Engine	CCAD	8.1
T700 ECU	CCAD	0.6
T700 Fuel Control	CCAD	0.4
T53 Fuel Control	CCAD	5.8
T63A-720 Engine	CCAD	7.1
OH-58 Main Rotor Hub	CCAD	1.0
M88 Transmission	ANAD	3.0
M88 Final Drive - Left	ANAD	0.5
M88 Final Drive - Right	ANAD	0.8
M113 Transmission	RRAD	1.3
M60 T142 Track	RRAD	7.4
M113A2 Engine	RRAD	4.2
M270 MLRS Launcher	RRAD	9.2
60 Ton Locomotive	TEAD	3.3
30KW Generator Set	TEAD	0.9
15KW Generator Set	TEAD	0.4
Miscellaneous Shop Equipment	TEAD	0.3
M578 Light Recovery Vehicle	LEAD	3.1
M12A1 Decon Apparatus	LEAD	2.3
Total		**59.7**

Table 5-3
FY92 Competition Program (Cont'd)

ITEM	CURRENT SOR	ANNUAL WORKLOAD VALUE ($ MILLIONS)
NAVAIR		
F-18	NORIS	35.8
J52 Engine	JAX	39.3
Total		**75.1**
Air Force		
Constant Speed Drive Transmissions	OC-ALC	2.0
C-18 Programmed Depot Maintenance (PDM)	Contract	5.0
Minuteman III Nuclear Hardness	Contract	7.0
C-141 Center Wing Box Replacement	WR-ALC	35.0
F-16 APG-68 Radar	Contract	8.0
Minuteman III Software	OO-ALC	7.0
Assorted Landing Gear	Contract	17.0
C-5 Speedline	SA-ALC	34.0
Test Equipment & Generators	SA-ALC	1.0
Total		**116.0**
Marine Corps		
AAV-P7A1 Engine	MCLBB	0.3
AAV-P7A1 Transmission	MCLBB	0.4
LAV-25	MCLBA	2.9
M998 Cargo Truck	MCLBA	4.7
Total		**8.3**

5.4 FY93 COMPETITION CANDIDATES

Table 5-4, on the following pages, lists the known workloads that are scheduled for competition during FY93.

Table 5-4
FY93 Competition Candidates

ITEM	CURRENT SOR	ANNUAL WORKLOAD VALUE ($ MILLIONS)
Army		
M109A2 Self Propelled Howitzer	RRAD	5.8
AH-1 T53-703 Engine	CCAD	2.9
UH-1 Main Rotor Hub	CCAD	3.6
UH-1 T53-L-13B Engine	CCAD	15.2
UH-1 Gearshaft	CCAD	2.0
AH-1/UH-1 Transmission	CCAD	6.3
CTASC I ADPE	Contract	2.0
AN/UYQ43 Maneuver Control	Contract	3.1
Klystron Tubes	Contract	4.5
DAS-3	Contract	1.4
Common Hardware/Software	Contract	2.0
TEAC Video Recorder	Contract	0.3
Forward Entry Device	Contract	0.3
Patriot Launcher Station	LEAD	2.0
MLRS, Rocket	RRAD	1.6
MLRS, Rocket Pods	Contract	7.9
M113A2 Carrier (Mainz)	Contract	15.5
M109 Transmission	LEAD	1.6
Total		**78.0**
NAVAIR		
T56 Engine/T56 Gearbox	ALMD	18.3
P-3 Aircraft	JAX	27.3
F404 Engine	JAX	11.0
H-60 Aircraft	PNCLA	14.1
T700 Engine	CCAD	7.0
Total		**77.7**
NAVSEA		
NAVSEA FY93 Competition Candidates are currently being reviewed by the Secretary ofthe Navy and are based on the results of the Fleet Scheduling Conference.		**218.6**
Air Force *		
KC-135 In Flight Refueling Boom	Contract	7.0
TF30 Turbine Blades	Contract	0.04
TF30 Airseal	Contract	0.2
TF33 Turbine Support	Contract	1.0
TF33 Exhaust Case	Contract	1.0
TF33 Fan Blade	Contract	1.0

* Air Force candidates are proposed

Table 5-4
FY93 Competition Candidates (Cont'd)

ITEM	CURRENT SOR	ANNUAL WORKLOAD VALUE ($ MILLIONS)
Air Force * (cont'd)		
Engine Containers	Contract	0.2
F-4C Starter	SA-ALC	0.4
F-15,B-52, E-3 Constant Speed Drives	OC-ALC	5.0
Air Turbine/Motors	OC-ALC	3.0
E-3 PDM/Modifications	OC-ALC	22.0
T-38 Gyro	AGMC	2.0
F-16 Block 40 Modification	OO-ALC	7.0
F-16 APG 66 Radar	OO-ALC	11.0
Miscellaneous Aircraft Wheels	OO-ALC	7.0
T56 Engine/T56 Gearbox	SA-ALC	36.0
F100 Unified Fuel Control	SA-ALC	22.0
Miscellaneous Fire Trucks	Contract	7.0
25K/40K Loaders	Contract	7.0
ALQ-131 II RAMPOD	WR-ALC	1.0
APG-63 Radar	WR-ALC	12.0
Transponder Bundle	WR-ALC	3.0
ALQ-155	WR-ALC	2.0
C-130 Propellers	WR-ALC	5.0
Total		**162.8**
Marine Corps		
AAV-P7A1 Block II Upgrade & Refurb	MCLBB	4.4
5-Ton Series Trucks	MCLBA	0.3
Total		**4.7**

* Air Force candidates are proposed

CHAPTER 6

CAPACITY UTILIZATION

6.1 CAPACITY AND UTILIZATION MEASUREMENT IMPROVEMENT

In FY90 a study was initiated by the Joint Policy Coordinating Group on Depot Maintenance (JPCG-DM) to review DOD capacity measurement and utilization policies. The results of that study and its recommended revisions to the then DOD 4151.15-H, Depot Maintenance Production Shop Capacity Measurement Handbook, 22 July 1976, were submitted to the Assistant Secretary of Defense (Production and Logistics) (ASD(P&L)) on 5 December 1990. ASD(P&L) approved the study report on 25 January 1991 and began a process of revising the capacity handbook, which will now be designated DOD 4151.18-H and entitled the Depot Maintenance Capacity and Utilization Measurement Handbook. Upon approval of the governing directive, DODD 4151.18, Maintenance of Military Material, publication of the capacity handbook will proceed.

6.2 CAPACITY SAVINGS BY SERVICE

Capacity utilization is a broad heading under which various types of savings actions are grouped. The unifying theme of these actions is that they promote a more cost effective use of DOD organic maintenance facilities.

The primary means of capacity utilization savings is consolidation, which decreases overhead costs by reducing the number of facilities necessary to complete depot workload requirements. Savings from military construction (MILCON) and capital equipment avoidance are also by-products of workload consolidations, since fewer new facilities, refurbishment and/or equipment are needed in performing depot maintenance.

Another major type of capacity utilization savings is that of process efficiencies. Through the application of Total Quality Management (TQM) procedures, depots are able to improve efficiency in accomplishing current workloads, thereby reducing customer costs.

Table 6-1 shows currently projected capacity savings, including savings achieved for FY91 and projected savings for FY92-FY97. Total anticipated savings for capacity is now $1,283.7M. Due to rounding, figures in tables in this chapter may not add exactly.

Table 6-1
Projected Capacity Savings
($ in Millions)

	FY91*	FY92	FY93	FY94	FY95	FY96	FY97	TOTAL
Army	7.7	9.7	27.3	120.1	120.9	138.9	154.4	579.0
NAVAIR	104.4	52.2	62.5	48.6	53.8	43.9	26.1	391.5
NAVSEA	1.0	14.5	21.6	35.8	70.8	69.3	69.3	282.3
Air Force**	0.1	10.8	8.4	1.2	3.2	3.4	3.5	30.6
Marine Corps***	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.4
Total	**113.3**	**87.3**	**119.9**	**205.8**	**248.7**	**255.5**	**253.3**	**1,283.7**

* FY91 column reflects savings achieved.
** Savings achieved by Air Force during FY91 were $0.07M.
*** Savings achieved by Marine Corps during FY91 were $0.05M.

6.3 CAPACITY UTILIZATION SUMMARY

This section provides tables which depict, by depot, the impact of all planned workload and capacity changes such as interservicing, consolidation, divestiture, facility and equipment layaway, on depot capacity utilization over the period FY91-FY97. The tables are comprised of four categories:

- Workload, which shows the amount of workload in direct labor hours that the depot anticipates in a given fiscal year;

- Capacity Index, which shows the amount of workload in direct labor hours that the depot can effectively produce annually on a single shift, 40-hour week basis;

- Utilization Index, which is a computation of dividing workload by capacity index;

- Competition Risk, which shows the amount of workload at risk due to competition.

Capacity and utilization data were computed in accordance with the methodology outlined in the DDMC Capacity Measurement Study Improvement Report, 5 December 1990. Capacity data represents the total capacity at each depot, including reserve and excess capacity. It is assumed that Competition Risk workload will be won by the current source

of repair. Thus, in each depot table, the amount shown for Competition Risk for a particular fiscal year is also included in the Workload total for the same fiscal year.

When appropriate, tables are followed by notes describing particular strategies for those depots. These notes also provide explanations of any unusual fluctuations shown by the data in a given table.

6.3.1 Army

Table 6-2
Anniston Army Depot (ANAD)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	3,483	3,670	3,285	3,114	1,956	1,916	1,916
Capacity Index	4,330	4,330	4,330	3,652	2,173	2,129	2,129
Utilization Index	80%	85%	76%	85%	90%	90%	90%
Competition Risk	--	0	-78	-301	-301	-301	-301

ANAD will be the Army Center of Technical Excellence (CTX) for all heavy combat vehicles and small arms. The following systems encompass heavy combat vehicles: Abrams M1 tank series, M60 tank series, associated heavy recovery vehicles, and the emerging heavy armored system modernization program. ANAD will bid on the electro-optics/night vision workload from Sacramento Army Depot (SAAD) in FY93, with work expected to begin at ANAD at the beginning of FY94. Small arms work will be transferred from the Ogden Air Logistics Center (OO-ALC) to ANAD by the end of FY92. The Army Tactical Missile System (ATACMS) maintenance program and stockpile reliability efforts will be assigned to Letterkenny Army Depot (LEAD). The ATACMS military construction project planned for ANAD in FY92 has been cancelled. As a result of the Marine Corps Logistics Base (MCLB) Barstow M1 Tank facility MILCON cancellation, ANAD will begin interservice work on Marine Corps M1 Tanks by the end of FY92. The Lance missile mission will remain at ANAD until it is phased out of the Army inventory. The Tube Launched Optically Tracked Wire Guide (TOW), Land Combat Support System (LCSS), Shillelagh and Dragon will transfer to LEAD. ANAD will layaway excess capacity to reach the 90 percent target. ANAD will bid on workload currently on national contract as opportunities arise during FY93 - FY97. In FY91, ANAD lost the bid for its military van (MILVAN) workload. In FY92, ANAD's work on the M88 Transmission, M88 Final Drive Left, and M88 Final Drive Right will be competitively bid with private and public sources of repair.

Table 6-3
Corpus Christi Army Depot (CCAD)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	4,308	4,042	4,244	4,114	4,430	4,640	4,640
Capacity Index	5,155	5,155	5,155	5,155	5,155	5,155	5,155
Utilization Index	84%	78%	82%	80%	86%	90%	90%
Competition Risk	--	0	-191	-256	-256	-256	-256

CCAD will be postured as the Army rotary wing CTX and depot maintenance facility. As such, CCAD will maintain the full spectrum for depot level core capability that is essential to provide sustainment support for all rotary wing aircraft. This sustainment effort includes airframe repair, modification, engine and component overhaul, blade repair, and a blade whirl tower capability. Army depot level maintenance repair work for the AH-64, UH-60, CH-47D, and OH-58D components, currently on interim contract support, will be transitioned and accelerated into CCAD to meet the core capability requirements of CCAD. In FY91, CCAD successfully bid on the T63-A-700 engine workload with an estimated workload value of $9.5M. In FY92, CCAD will bid on six separate packages of depot maintenance work with an estimated value of $23.0M. In FY93, CCAD will bid on the gyro/indicators work from SAAD.

Table 6-4
Letterkenny Army Depot (LEAD)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	2,021	2,157	2,140	2,163	2,679	3,467	3,567
Capacity Index	2,576	2,590	2,380	2,401	2,881	3,611	3,716
Utilization Index	78%	83%	90%	90%	93%	96%	96%
Competition Risk	--	0	-28	-198	-198	-198	-198

LEAD will be postured as the DOD specialized missile components and missile support equipment CTX and integrated depot level/intermediate maintenance facility. This consolidates guidance and control section repair for all current and future tactical air, ground, and surface launched missiles. The missile support equipment includes Army-only launchers, radars, associated ancillary equipment, and subsystem repair of missile platforms mounted on track or wheeled vehicles for which system integrity is not impacted by their removal and repair at LEAD. All Army artillery workload, with the exception of the Palladin conversion, will be consolidated at Red River Army Depot (RRAD) consistent with DDMC study decisions. Supply Class V items or components for missiles will be maintained at designated storage facilities. Explosive storage and/or maintenance

capability for missiles will be accomplished through a source of repair decision. The near-term savings plan consolidated the tactical vehicle workload at Tooele Army Depot (TEAD). In FY91, LEAD successfully bid on the Patriot Launcher. In FY92, LEAD will bid on the M12A1 Decon Apparatus, with a total estimated value of $2.3M. In FY93, LEAD will bid on the radar workload from SAAD. LEAD capacity will be converted from tactical vehicle/artillery capability to missile capability in a time-phased schedule to match the increased missile mission.

Table 6-5
Red River Army Depot (RRAD)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	2,373	2,786	2,794	2,802	2,733	2,473	2,473
Capacity Index	3,515	3,454	3,474	3,377	3,037	2,748	2,748
Utilization Index	68%	81%	80%	83%	90%	90%	90%
Competition Risk	--	0	-293	-589	-589	-589	-589

RRAD will be postured as the Army light combat vehicle CTX and depot maintenance facility. Included are armored personnel carriers, assault vehicles, air defense weapon system carriers, land combat missile system platforms (where system integration requirements with the tracked carrier demands repair/overhaul of the platform at RRAD), light tracked anti-tank and communications station carriers, track overhaul, and towed and self-propelled artillery. Inherent in the repair/modification for assigned systems is the associated repair of engines and other secondary items. Depot level support for Multiple Launch Rocket System (MLRS), TOW, and Chaparral will transfer to LEAD. Artillery work will transfer to RRAD from LEAD. Mainz Army Depot (MZAD) workload of appropriate items will transfer to RRAD in FY93. RRAD will layaway excess capacity to reach the 90 percent target. In FY91, RRAD lost its bid for M113 engines to private industry. In FY92 RRAD will bid on M113 transmissions, M113A2 engines, M60 T142 track, M578 Light Recovery Vehicle, and the M270 MLRS launcher with an estimated value of $25.2M. In the outyears, RRAD will have opportunities to bid on additional work from national contracts and other Services.

Table 6-6
Sacramento Army Depot (SAAD)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	2,008	2,014	1,308	670	0	0	0
Capacity Index	3,339	3,339	3,339	3,339	0	0	0
Utilization Index	60%	60%	39%	20%	N/A	N/A	N/A
Competition Risk	--	0	0	0	0	0	0

As a result of the 1991 Base Realignment and Closure (BRAC) process, SAAD will be closed. The realignment of the SAAD maintenance workload will be determined by sequentially phased competitions between Army and the Air Force. The Army depots are Anniston, Corpus Christi, Letterkenny, Red River and Tobyhanna. The Air Force designated depot is Sacramento Air Logistics Center (SM-ALC). Each Army Materiel Command (AMC) major subordinate command (MSC) with workload currently at SAAD will be involved in the process. The MSC's included are: Missile Command (MICOM); Communications-Electronics Command (CECOM); Aviation Systems Command (AVSCOM); Armament, Munitions and Chemical Command (AMCCOM); Troop Support Command (TROSCOM); and Tank-Automotive Command (TACOM).

The SAAD workload has been divided into nine competition packages of logical groupings of workload. These groupings will be competed in sequentially phased, overlapping schedules for solicitation preparation, bid preparation, and evaluation/award. The savings associated with closing SAAD and realigning its workload has been taken under the near-term plan. The Sacramento Army Depot Base Closure and Realignment Implementation Plan, 23 August 1991, contains the details of this closure/realignment.

Table 6-7
Tobyhanna Army Depot (TOAD)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	3,437	3,336	3,268	3,680	3,606	3,534	3,534
Capacity Index	5,207	5,207	5,207	5,452	4,242	3,927	3,927
Utilization Index	66%	64%	63%	67%	85%	90%	90%
Competition Risk	--	0	0	-1,309	-1,309	-1,309	1,309

TOAD will be postured as the Army CTX and depot level overhaul/repair facility for ground communication-electronics (GCE), Communications Security (COMSEC) (1988 BRAC decision), and associated equipment. Included in the posturing objective are all

communications and COMSEC equipment, i.e., radios, computers, transmission equipment, and repair/modification/fabrication of associated shelters and containers. TOAD is designated as the Army CTX for automated test equipment and associated test program set development. The existing missile workload and associated diagnostic equipment will be transferred to LEAD. TOAD will remain as the CTX for satellite and fixed station strategic equipment. TOAD will compete for five of the nine solicitation packages covering the SAAD workload in FY92 and FY93 (1991 BRAC). The above workload and competition at risk numbers include the SAAD workload. In FY91, TOAD won its bid to retain the RT-524 radio. Upon completion of the SAAD workload competition, TOAD will have the opportunity to bid on other Army depot maintenance workload. TOAD will downsize to reach 90 percent capacity utilization as required.

Table 6-8
Tooele Army Depot (TEAD)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	2,143	2,197	1,356	1,320	1,068	1,046	1,046
Capacity Index	2,670	2,670	2,622	2,057	1,335	1,231	1,162
Utilization Index	80%	82%	52%	64%	80%	85%	90%
Competition Risk	--	0	-67	-67	-67	-67	-67

TEAD will be postured as the Army CTX and depot level maintenance facility for tactical vehicles, rail equipment and general purpose and construction equipment. The Consolidated Maintenance Facility (CMF), which will be operational in October 1992, is critical to ensure cost effective repair of assigned workload. Army gas turbine engine (GTE) workload will be transferred to the Air Force. The TEAD rail facility will be the site of the consolidation of the mobile rail repair shops located at RRAD, Defense Depot Region East (formerly New Cumberland Army Depot), and TEAD. TEAD received the tactical vehicle workload from LEAD at the beginning of FY92. In FY91, TEAD won its bid to retain the 2 1/2 ton engine repair program. In FY92, TEAD will compete for 60 ton locomotives, 15KW and 30KW generators sets, and miscellaneous shop equipment, with an estimated value of $4.9M. Capacity associated with missions transferring to the Marine Corps and Air Force will be eliminated, as will excess capacity in the old buildings replaced by the CMF.

6.3.2 Naval Air Systems Command

Each Naval Aviation Depot (NADEP) has developed a capacity reduction plan which includes buildings to be closed. Overall, 87,000 square feet of NADEP space was eliminated during FY91. An integral part of these reduction plans are process improvements. Naval Air Systems Command (NAVAIR) recognizes that continuous improvement of all processes is the means by which true long-term savings will be achieved. Since the 1980s, its depots have focused their efforts toward improving key processes thereby improving upon capacity utilization. Concepts such as the Program Management Team Office (eliminating barriers between depots using elements of Juran and Deming), statistical process control (SPC), process improvement teams (PIT), Manufacturing Resources Planning (MRP II), Just in Time (JIT), and Total Quality Management (TQM), are integral parts of the NAVAIR process improvement program.

Table 6-9
Naval Aviation Depot Alameda (NADEP Alameda)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	3,375	2,626	2,516	2,466	2,438	2,147	2,108
Capacity Index	5,055	2,915	2,791	2,734	2,702	2,377	2,332
Utilization Index	67%	90%	90%	90%	90%	90%	90%
Competition Risk	--	-293	-356	-303	-459	-322	-320

NADEP Alameda is undergoing a single siting effort with the transfer of the T56 engine and gear box rework from NADEP Norfolk. All P-3 aircraft Standard Depot Level Maintenance (SDLM) and the J52 aircraft engines will be transferred from NADEP Alameda to NADEP Jacksonville for rework. All airborne missile guidance and control units will be transferred to LEAD for depot level rework. By 1993, 175,715 square feet of unutilized depot space will be returned to the host activity.

Table 6-10
Naval Aviation Depot Cherry Point (NADEP Cherry Point)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	3,503	2,419	2,592	1,960	2,028	1,967	1,987
Capacity Index	3,136	2,639	2,838	2,140	2,209	2,148	2,130
Utilization Index	112%	92%	91%	92%	92%	92%	93%
Competition Risk	--	-156	-316	-134	-131	-127	-126

NADEP Cherry Point is undergoing a single siting effort with the transfer of the T58 engine rework in 1991 and the T64 engine rework in 1993 from NADEP North Island. All

CH-46 helicopters and A-4 aircraft SDLMs will be performed at NADEP Cherry Point, while the C-130 SDLM workload will be transferred to OO-ALC under an interservice agreement. The Air Force F-4 aircraft workload and the J79 engine workload will be interserviced to NADEP Cherry Point. 27,290 square feet of unutilized space will be returned to the host activity by 1995.

Table 6-11
Naval Aviation Depot Jacksonville (NADEP Jacksonville)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	2,363	2,426	2,583	2,056	2,240	2,118	2,025
Capacity Index	2,947	2,693	2,863	2,271	2,484	2,349	2,243
Utilization Index	80%	90%	90%	90%	90%	90%	90%
Competition Risk	--	-188	-378	-390	-533	-449	-388

NADEP Jacksonville is undergoing a single siting effort with the transfer of all P-3 aircraft SDLMs from NADEP Alameda and the T-2 trainer SDLM from NADEP Pensacola. NADEP Jacksonville will become the designated overhaul point for the J52 and F404 aircraft engines. By 1993, NADEP Jacksonville plans to reduce the total depot floor space by 217,833 square feet.

Table 6-12
Naval Aviation Depot Norfolk (NADEP Norfolk)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	3,649	3,133	3,373	2,873	2,802	2,808	2,984
Capacity Index	3,741	3,314	3,606	3,145	3,081	3,085	3,237
Utilization Index	98%	95%	94%	91%	91%	91%	92%
Competition Risk	--	-188	-163	-164	-318	-284	-300

NADEP Norfolk is undergoing a single siting effort with the transfer of aircraft, missile, and other workloads. All F110 and TF30 engine workload will be transferred to Oklahoma Air Logistics Center (OC-ALC). All T56 engine workload and the T56 Gear Box has been transferred to NADEP Alameda. All airborne missile guidance and control units will be transferred to LEAD. NADEP Norfolk will retain the F-14 SDLM workload, and the A-6 SDLM workload will be single sited after the rewing is complete. Unutilized facilities will be returned to the host activity.

Table 6-13
Naval Aviation Depot North Island (NADEP North Island)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	3,555	2,706	2,546	2,359	2,478	2,595	2,656
Capacity Index	4,472	2,992	2,808	2,608	2,711	2,837	2,877
Utilization Index	80%	90%	91%	90%	91%	91%	92%
Competition Risk	--	-161	-597	-519	-576	-691	-767

NADEP North Island is undergoing a single siting effort with the transfer of all CH-46 SDLM to NADEP Cherry Point, all F-14 SDLMs to NADEP Norfolk, and all F404 engine workload to NADEP Jacksonville. All F/A-18 aircraft will be reworked at NADEP North Island. The depot will lose the T58 and T64 engine overhaul effort to NADEP Cherry Point. Unutilized facilities will be returned to the host activity.

Table 6-14
Naval Aviation Depot Pensacola (NADEP Pensacola)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	3,331	3,054	2,871	2,701	2,817	2,706	2,828
Capacity Index	3,650	3,375	3,187	2,995	3,093	2,964	3,069
Utilization Index	91%	90%	90%	90%	91%	91%	92%
Competition Risk	--	-264	-232	-244	-272	-227	-259

NADEP Pensacola is undergoing a single siting effort with the transfer of all T-2 SDLM workload to NADEP Jacksonville in FY91, and all A-4 SDLM workload to NADEP Cherry Point in FY92. Unutilized facilities will be returned to the host activity.

6.3.3 Naval Sea Systems Command

Table 6-15
Naval Shipyard Portsmouth (NSY Portsmouth)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	6,613	6,130	6,176	5,506	4,070	5,012	5,556
Drydock Utilization	140%	36%	66%	38%	20%	37%	52%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Portsmouth's workload consists primarily of nuclear submarine repair and modernization. The First SSN-688 class refueling will start in FY93. These refueling overhauls will be the predominant feature of the shipyard's workload for the balance of the decade.

Table 6-16
Naval Shipyard Philadelphia (NSY Philadelphia)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	8,798	8,308	6,049	5,651	4,028	0	0
Drydock Utilization	89%	90%	25%	29%	0%	0%	0%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Philadelphia is slated to close in 1996 due to the BRAC-91 decision. Its workload through FY95 includes the overhaul of the USS JOHN F. KENNEDY (CV-67) and the conversion of the USS FORRESTAL (CV-59) to ATV-59. In addition, the shipyard will be involved with environmental clean-up and closure preparation.

Table 6-17
Naval Shipyard Norfolk (NSY Norfolk)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	11,016	12,755	10,485	9,596	9,142	11,128	11,566
Drydock Utilization	61%	103%	94%	41%	28%	64%	48%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Norfolk's workload includes nuclear and non-nuclear repair and modernization of all types of Navy surface ships and submarines. The shipyard began refueling of the nuclear cruisers in FY92 and will continue that work through FY97. The shipyard will also perform the inactivation of several aircraft carriers during this period.

Table 6-18
Naval Shipyard Charleston (NSY Charleston)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	7,385	7,565	7,112	5,944	6,406	6,283	6,474
Drydock Utilization	142%	64%	85%	95%	67%	46%	45%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Charleston's workload includes nuclear and non-nuclear repair and modernization on surface ships and submarines. It begins SSN-688 class refueling in FY95. These refueling overhauls will be the predominant feature of the shipyards workload for the balance of the decade.

Table 6-19
Naval Shipyard Puget Sound (NSY Puget Sound)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	12,135	13,917	12,753	14,018	12,050	14,821	17,803
Drydock Utilization	219%	203%	184%	177%	156%	128%	176%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Puget Sound's workload includes nuclear and non-nuclear repair, modernization, and inactivation on all types of Navy surface ships and submarines. All nuclear submarine recycling is completed at Naval Shipyard Puget Sound. In FY93 it will perform the first SSBN-726 class overhaul and will continue overhauling OHIO class ballistic missile submarines.

Table 6-20
Naval Shipyard Mare Island (NSY Mare Island)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	6,483	7,153	6,778	7,393	6,764	5,317	7,644
Drydock Utilization	148%	142%	112%	72%	58%	54%	61%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Mare Island's workload consists primarily of nuclear surface ship and submarine repair and modernization. It will begin SSN-688 refuelings in FY93. These refueling overhauls will be the predominant feature of the shipyard's workload for the balance of the decade.

Table 6-21
Naval Shipyard Long Beach (NSY Long Beach)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	3,770	4,389	3,990	3,474	3,636	3,434	3,516
Drydock Utilization	132%	38%	33%	12%	42%	34%	29%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Long Beach's workload is primarily surface ship non-nuclear repair and modernization. In addition to Naval Shipyard Puget Sound, it is the only other facility on the west coast capable of docking conventional aircraft carriers. The shipyard is also the emergent drydocking site for nuclear aircraft carriers.

Table 6-22
Naval Shipyard Pearl Harbor (NSY Pearl Harbor)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Shipyard Workload	4,787	4,569	5,161	4,554	4,346	3,723	2,076
Drydock Utilization	103%	76%	66%	62%	56%	70%	27%
Competition Risk	--	0	0	0	0	0	0

Naval Shipyard Pearl Harbor's workload consists of nuclear and non-nuclear repair and modernization of surface ships and submarines. It is in a forward deployed strategic location and thus must have the capability of working on a variety of ships and submarines. The shipyard's future workload includes SSN-688 class and DD-963 class availabilities.

Table 6-23
Naval Weapons Station Earle (NWS Earle)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	33	33	35	35	35	35	35
Capacity Index	54	54	54	54	54	54	54
Utilization Index	61%	61%	65%	65%	65%	65%	65%
Competition Risk	--	0	0	0	0	0	0

Table 6-24
Naval Surface Warfare Center Indian Head (NSWC Indian Head)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	149	223	221	218	213	215	216
Capacity Index	134	196	194	191	187	187	189
Utilization Index	111%	114%	114%	114%	114%	115%	114%
Competition Risk	--	0	0	0	0	0	0

Table 6-25
Naval Surface Warfare Center Crane (NSWC Crane)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	660	629	600	677	687	681	676
Capacity Index	682	711	776	821	852	774	769
Utilization Index	97%	88%	77%	82%	81%	88%	88%
Competition Risk	--	0	0	0	0	0	0

Table 6-26
Naval Surface Warfare Center Louisville (NSWC Louisville)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	1,157	1,197	1,075	1,169	1,436	1,361	1,325
Capacity Index	1,016	1,063	948	1,040	1,271	1,206	1,168
Utilization Index	114%	113%	113%	112%	113%	113%	113%
Competition Risk	--	0	0	0	0	0	0

Table 6-27
Naval Weapons Station Yorktown (NWS Yorktown)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	53	49	73	70	65	64	61
Capacity Index	63	63	63	63	63	63	63
Utilization Index	84%	78%	116%	111%	103%	102%	97%
Competition Risk	--	0	0	0	0	0	0

Table 6-28
Naval Weapons Station Charleston (NWS Charleston)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	22	33	28	26	26	26	26
Capacity Index	54	54	54	54	54	54	54
Utilization Index	41%	61%	52%	48%	48%	48%	48%
Competition Risk	--	0	0	0	0	0	0

Table 6-29
Naval Undersea Warfare Center Keyport (NUWC Keyport)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	2,097	2,050	1,942	1,820	1,836	1,836	1,836
Capacity Index	2,600	2,600	2,466	2,367	2,297	2,204	2,119
Utilization Index	81%	79%	79%	77%	80%	83%	87%
Competition Risk	--	0	0	0	0	0	0

Table 6-30
Naval Weapons Station Concord (NWS Concord)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	27	15	14	14	14	14	14
Capacity Index	147	147	147	147	147	147	147
Utilization Index	18%	10%	10%	10%	10%	10%	10%
Competition Risk	--	0	0	0	0	0	0

Table 6-31
Naval Weapons Station Seal Beach (NWS Seal Beach)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	268	280	279	235	229	254	279
Capacity Index	454	462	462	462	462	462	462
Utilization Index	59%	61%	60%	51%	50%	55%	60%
Competition Risk	--	0	0	0	0	0	0

NWS Seal Beach performs depot level maintenance on missile and aircraft support equipment. The utilization index reflects the anticipated funded workload.

6.3.4 Space and Naval Warfare Systems Command

Table 6-32
Naval Electronic Systems Engineering Center San Diego
(NAVELEXSYSENGCEN, San Diego)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	526	606	620	630	650	650	650
Capacity Index	660	660	660	660	660	660	660
Utilization Index	80%	92%	94%	95%	98%	98%	98%
Competition Risk	--	0	0	0	0	0	0

Table 6-33
Naval Electronic Systems Engineering Center Portsmouth
(NAVELEXCSYSENGCEN, Portsmouth)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	517	503	522	545	565	590	610
Capacity Index	615	615	615	615	615	615	615
Utilization Index	84%	82%	85%	89%	92%	96%	99%
Competition Risk	--	0	0	0	0	0	0

6.3.5 Air Force

Table 6-34
Oklahoma City Air Logistics Center (OC-ALC)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	7,662	7,072	7,366	7,007	6,770	6,644	6,642
Capacity Index	11,291	7,644	8,064	8,042	7,862	7,729	7,729
Utilization Index	68%	93%	91%	87%	86%	86%	86%
Competition Risk	--	--	-20	-343	-343	-343	-343

OC-ALC is the source of repair (SOR) for the B-1B, B-2, B-52G/H, C-135, and E-3 aircraft. Also repaired are the TF30, TF33, TF41, J57, F103, F107, F108, F110, F112, and F118 aircraft engines. OC-ALC is the Technology Repair Center (TRC) for hydraulics/pneudraulics (fluid driven transmissions/constant speed drives (CSD), air driven accessories - except ram air turbines), oxygen components, and instruments (automatic flight control systems, engine). Interservice workload transfers affecting OC-ALC include the transfer of the J79 engine workload to the Navy in FY92, and transfer of all TF30 engine and F110 engine workloads from the Navy to OC-ALC in FY93. Air Force blade and vane workload will be consolidated at OC-ALC. Realignment of facilities and identification and turn in of excess equipment are ongoing efforts to align capacity and workload.

Table 6-35
Ogden Air Logistics Center (OO-ALC)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	6,866	6,875	6,890	6,171	6,296	6,045	6,072
Capacity Index	8,165	7,150	7,947	7,713	7,196	7,168	7,168
Utilization Index	84%	96%	87%	80%	87%	84%	85%
Competition Risk	--	--	-7	-233	-233	-233	-118

OO-ALC is the SOR for the C-130 and F-16 aircraft and large missiles (Minuteman, Peacekeeper). OO-ALC is the TRC for weapons, air munitions, missile components, ram air turbines, landing gears, photographic equipment, training and simulation equipment, and instruments (all navigation except inertial systems; electrical/mechanical; and pressure, temperature, and humidity measuring). Interservice workload transfer decisions affecting OO-ALC include the transfer of Navy C-130 aircraft to OO-ALC in FY93, Navy C-130 and F-14 landing gears to OO-ALC in FY92, Air Force F-4 aircraft to the Navy in FY93, Air Force small arms to the Army in FY92, Air Force Sidewinder missiles to the Army in FY93, and Air Force Maverick missiles to the Army in FY96. OO-ALC is

competing for the Minuteman III nuclear hardness, Minuteman III software, and assorted contracted landing gear workloads in FY92. OO-ALC will divest approximately 0.7 million square feet of maintenance facilities during FY92-FY95. Capacity requirements continue to be considered and adjusted as the Depot Maintenance Industrial Fund (DMIF) Resource Management Plan is administered and updated.

Table 6-36
San Antonio Air Logistics Center (SA-ALC)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	8,585	8,193	7,289	7,417	7,202	5,998	5,279
Capacity Index	8,935	8,935	8,935	8,935	8,935	8,935	8,935
Utilization Index	96%	92%	82%	83%	81%	67%	59%
Competition Risk	--	--	-610	-951	-916	-307	-300

SA-ALC is the SOR for the B-52G/H, C-5, and C-17 aircraft as well as GTE/Auxiliary Power Units (APU), T56, TF39, F100, F117, and F119 aircraft engines. SA-ALC is the TRC for electronic support equipment, electro/mechanical support equipment, nuclear components, and instruments (engine). Workload at SA-ALC is decreasing due to force structure reductions and weapon systems reductions. Final resolution of B-52 workload assignments (proposed consolidation at OC-ALC) is pending final force structure decision. The interservice workload transfer affecting SA-ALC is the transfer of the GTE from the Army in FY93. Blade and vane workload will be consolidated to OC-ALC in FY92. SA-ALC is competing for the test equipment and generators workload in FY92. SA-ALC workload decreases are offset by the T-38 modification workload beginning in FY92 and the anticipated start of C-17 workload in FY95. As workload adjustments are finalized, capacity adjustments to follow workload shifts will be completed.

Table 6-37
Sacramento Air Logistics Center (SM-ALC)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	6,867	6,495	6,387	6,268	6,032	6,028	6,016
Capacity Index	8,596	7,705	6,819	7,250	7,250	7,248	7,248
Utilization Index	80%	84%	94%	86%	83%	83%	83%
Competition Risk	--	0	0	-164	-166	-166	-150

SM-ALC is the SOR for the A-10, F-15, F-22, EF/F/FB-111, KC-135, and T-37. SM-ALC is the TRC for electric components, ground -electronics, hydraulics/pneudraulics (fluid driven accessories except transmissions/constant speed drives), instruments (flight control), and shelters. Projected force structure and weapon systems drawdowns impact workload. SM-ALC is unaffected by DDMC directed interservice workload transfers. SM-ALC is competing in the public-public SAAD workload competitions. Ongoing capacity and workload alignment analysis supports effective resource management planning. SM-ALC projects that during FY92-FY95, it will divest approximately five hundred thousand square feet from its maintenance facilities.

Table 6-38
Warner Robins Air Logistics Center (WR-ALC)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	7,474	7,046	7,151	7,058	6,605	6,587	6,142
Capacity Index	7,595	8,075	7,693	7,486	7,486	7,486	7,486
Utilization Index	98%	87%	93%	94%	88%	88%	82%
Competition Risk	--	--	-570	-946	-946	-262	-262

WR-ALC is the SOR for the C-130, C-141, and F-15 aircraft. WR-ALC is the TRC for airborne electronics, life support equipment, propellers, and instruments (gyroscopes except displacement). The C-141 Speedline will be competed by the end of FY93. Realignment of facilities and equipment to meet projected workloads are ongoing.

Table 6-39
Aerospace Guidance and Metrology Center (AGMC)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	1,666	1,232	1,128	1,120	1,106	1,079	1,079
Capacity Index	1,597	1,643	1,468	1,435	1,379	1,330	1,330
Utilization Index	104%	75%	77%	78%	80%	81%	81%
Competition Risk	--	--	--	-20	-20	-20	-20

AGMC provides systems management of 140 Precision Measurement Equipment Laboratories (PMEL) worldwide. AGMC tests and repairs inertial guidance and navigation systems and components for a variety of missile and aircraft weapon systems. Capacity reduction is constrained by required specialized equipment and facilities.

6.3.6 Marine Corps

Utilization percentages are higher than normal for both Marine Corps depots during the FY92-FY94 period because of extensive use of overtime and temporary employees to execute the Desert Storm workload.

Table 6-40
Marine Corps Logistics Base Albany (MCLB Albany)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	1,151	1,582	1,674	1,330	1,180	1,087	1,056
Capacity Index	1,091	1,174	1,201	1,211	1,218	1,218	1,218
Utilization Index	105%	135%	139%	110%	97%	89%	87%
Competition Risk	--	-145	-118	-113	-93	-16	-11

For MCLBA no adverse impacts to capacity utilization are currently anticipated.

Table 6-41
Marine Corps Logistics Base Barstow (MCLB Barstow)
(DLH 000)

	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Workload	916	1,501	1,718	1,382	1,187	1,135	1,168
Capacity Index	1,019	1,169	1,169	1,173	1,173	1,173	1,173
Utilization Index	90%	128%	147%	118%	101%	97%	100%
Competition Risk	--	-6	-90	-92	-147	-140	-56

For MCLBB no adverse impacts to capacity utilization are currently anticipated.

APPENDIX A
DEPOT MAINTENANCE VISION OF THE FUTURE
1995 AND BEYOND. . .

The Army, Navy, Air Force, and Marine Corps depot maintenance facilities are the cornerstones of defense readiness. The combined strengths of the depots, shipyards, ordnance stations and specialized depot maintenance activities, in partnership with the inventory and supply activities of the Services and Defense Logistics Agency, form an efficient and responsive industrial base that is essential to the sustained application of land, sea and air power in peacetime and in war. They provide cost effective and technically superior maintenance, logistics and engineering support to our operating forces worldwide. The world class quality of their products and services is both recognized and expected by their customers.

The depot maintenance facilities exist in a competitive environment with rapidly changing and often conflicting priorities. Defense Management Review initiatives have promoted and facilitated businesslike, cost effective operations while maintaining the depot infrastructure necessary to meet each Service's military mission. A balance between military and economic objectives is maintained. The Services have identified core mission requirements and supporting skills and resources, to ensure a responsive industrial capability and capacity tailored to each Service's unique maintenance, logistics and engineering needs. Having satisfied core, the Services have implemented a joint strategy, under the aegis of the Defense Depot Maintenance Council, to size their facilities consistent with force structures and force levels, to substantially increase the amount of work that is accomplished through interservicing, and to compete actively against each other, and against private industry, for above-core workload requirements.

In order to be competitive, yet remain responsive to and focused on their customers, the depot maintenance facilities have evolved into smaller, more robust and specialized operations. They are information-based, and share common data systems within and between the Services. They have installed technologically advanced, systems-intensive repair and manufacturing processes. The work force is trained in the application and use of systems to facilitate management and technical decisions. All facilities have computer aided design and manufacturing capabilities. Operational data throughout the depots are transmitted and managed electronically. The use of hard copy is held to a minimum. Systems training is continual. Data is managed as a corporate resource.

The Services have completed plans to increase utilization of capacity. The pursuit of maximum utilization through innovative technologies and human resource management is constant. There is no perceived upper limit since utilization is based on an economic analysis of the cost of throughput and the Services continuously seek to reduce the total cost of operations.

The depot maintenance facilities are responsible and proactive stewards of safety and the environment. They are in compliance with federal, state and local environmental and safety laws. They act in partnership with local communities to continually monitor the environmental impacts of industrial operations and seek joint solutions to potential problems. Through active research and development programs, with supporting capital equipment plans, the depots introduce new technologies to continuously reduce the risk of environmental hazards.

The facilities are sized, in terms of capacity and capability, to the operating forces' technology and workload requirements. They are postured to respond quickly and directly to the changing, often unpredictable demands of the operating forces. Their capabilities complement and are augmented by private industry. Core skills and resources, with supporting workload, are postured at the minimum necessary to maintain efficient peacetime operations and meet mobilization contingencies. Reserve capacity is held to the absolute minimum.

Production lines are designed for fast setup, quick turnaround, optimum throughput operations. The work force is flexible in terms of size and skills. The work force may include other than permanent personnel, permitting management to rapidly size the work force to available work. Managers are as versed in business principles and practices as their private sector counterparts. Employees are multi-skilled to adjust to changing production priorities and respond to competitive opportunities. Managers, supervisors and employees operate as a team with the full support of unions and other employee groups. Business practices are facilitated by supporting laws and policies.

Maximum utilization of resources is the determining factor in capital investment decisions and assignment of new workload. Investments in plant, equipment and systems are based on an assessment of unique Service requirements, life-cycle cost, and defense-wide organic and commercial capabilities and capacities. New investment in the organic facilities is at a minimum level that sustains a modern, efficient and technologically responsive industrial base. Joint Service investment strategies are developed through the Defense Depot Maintenance Council.

The Services have eliminated unnecessary redundant capabilities. Depot maintenance facilities are focused on assigned specific technologies and workloads. Facilities are staffed and equipped to support their Service's core requirements, joint Service core work and work awarded competitively. The facilities do not independently establish or maintain capability when it either exists or is assigned elsewhere. Required redundant capability is held to a minimum and is based solely on core considerations, total defense requirements and cost of throughput. The Services make joint decisions, through the Joint Policy Coordinating Group on Depot Maintenance, on new workload assignments, consolidations of existing workload and competitive opportunities.

Competition is sought after. Each Service has established technical excellence

that is competitive with the best that private industry has to offer. The depot facilities compete against each other and against private industry when and where it makes good economic sense. Competition opportunities are focused on ships and weapon systems modernization and maintenance, and manufacturing of related parts. The Services share resources to take full advantage of competitive opportunities and maximize cost effectiveness. Service acquisition strategies actively promote and facilitate competitions.

Under the guidance, direction and sponsorship of the Defense Depot Maintenance Council, and through the auspices of the Joint Policy Coordinating Group on Depot Maintenance, the Services have achieved a mutually supportive, cost effective and technically superior industrial infrastructure which meets the needs of individual and unique Services missions, while providing best value to the Department of Defense.

APPENDIX B
SERVICE DEPOT MAINTENANCE ACTIVITIES AND CODES

CODE	NAME
	ARMY
ANAD	Anniston Army Depot
CCAD	Corpus Christi Army Depot
LBAD	Lexington-Bluegrass Army Depot*
LEAD	Letterkenny Army Depot
PUDA	Pueblo Depot Activity*
RRAD	Red River Army Depot
SAAD	Sacramento Army Depot**
TOAD	Tobyhanna Army Depot
TEAD	Tooele Army Depot

* On 1988 Base Closure List
** On 1991 Base Closure List

	NAVAIR
ALMD	Naval Aviation Depot Alameda
CHYPT	Naval Aviation Depot Cherry Point
JAX	Naval Aviation Depot Jacksonville
NORVA	Naval Aviation Depot Norfolk
NORIS	Naval Aviation Depot North Island
PNCLA	Naval Aviation Depot Pensacola
	NAVSEA (SHIPYARDS)
PTNSY	Portsmouth Naval Shipyard
PNSY	Philadelphia Naval Shipyard*
NNSY	Norfolk Naval Shipyard
CHNSY	Charleston Naval Shipyard
PSNSY	Puget Sound Naval Shipyard
MINSY	Mare Island Naval Shipyard
LBNSY	Long Beach Naval Shipyard
PHNSY	Pearl Harbor Naval Shipyard

* On the 1991 Base Closure List for preservation

NOTE: Does not include overseas depots.

APPENDIX B
SERVICE DEPOT MAINTENANCE ACTIVITIES AND CODES
(Cont'd)

CODE	NAME
	(NAVAL ORDNANCE ACTIVITY GROUP)
NWSEL	Naval Weapons Station Earle
NSWCIH	Naval Surface Warfare Center Indian Head
NSWCC	Naval Surface Warfare Center Crane
NSWCL	Naval Surface Warfare Center Louisville
NWSYK	Naval Weapons Station Yorktown
NWSCH	Naval Weapons Station Charleston
NUWCK	Naval Undersea Warfare Center Keyport
NWSCO	Naval Weapons Station Concord
NWSSB	Naval Weapons Station Seal Beach
	SPAWAR
NESECS	Naval Electronic Systems Engineering Center San Diego
NESECP	Naval Electronic Systems Engineering Center Portsmouth
	AIR FORCE
OC-ALC	Oklahoma City Air Logistics Center
OO-ALC	Ogden Air Logistics Center
SA-ALC	San Antonio Air Logistics Center
SM-ALC	Sacramento Air Logistics Center
WR-ALC	Warner Robins Air Logistics Center
AGMC	Aerospace Guidance and Metrology Center
AMARC	Aerospace Maintenance and Regeneration Center
	MARINE CORPS
MCLBA	Marine Corps Logistics Base Albany
MCLBB	Marine Corps Logistics Base Barstow

NOTE: Does not include overseas depots.

APPENDIX C
ABBREVIATIONS/ACRONYMS

ACBP	Army Corporate Business Plan
AFB	Air Force Base
AFMC	Air Force Materiel Command
AGMC	Aerospace Guidance and Metrology Center
AIM	Advanced Industrial Management
ALMD	Naval Aviation Depot Alameda
AMARC	Aerospace Maintenance and Regeneration Center
AMC	Army Materiel Command
AMCCOM	Armament, Munitions and Chemical Command
ANAD	Anniston Army Depot
APCS	Automated Production Control System
APU	Auxiliary Power Unit
ASD(C^3I)	Assistant Secretary of Defense (Command, Control, Communication, and Intelligence)
ASD(P&L)	Assistant Secretary of Defense (Production & Logistics)
ASO	Aviation Supply Office
ATACMS	Army Tactical Missile System
ATE	Automatic Test Equipment
AVSCOM	Aviation Systems Command
AOR	Accumulated Operating Result
BOC	Business Operating Center
BRAC	Base Realignment and Closure
CAD2	Computer Aided Design
CALS	Computer Aided Logistics Support
CAT	Combat, Artillery, and Tactical
CBP	Corporate Business Plan
CCAD	Corpus Christi Army Depot
C-E	Communications-Electronics
CECOM	Communications-Electronics Command
CETS	Contract Engineering Technical Services
CFT	Contract Field Team
CHNSY	Charleston Naval Shipyard
CHYPT	Naval Aviation Depot Cherry Point
CIM	Corporate Information Management
CMF	Consolidated Maintenance Facility
CNO	Chief of Naval Operations
COMSEC	Communications Security
CONUS	Continental United States

APPENDIX C
ABBREVIATIONS/ACRONYMS
(Cont'd)

COSP	Corporate Operations Strategy and Plan
CPP	Capital Purchases Program
CSD	Constant Speed Drive
CTX	Centers of Technical Excellence
DBOF	Defense Business Operations Fund
DDMC	Defense Depot Maintenance Council
DEPSECDEF	Deputy Secretary of Defense
DLA	Defense Logistics Agency
DLH	Direct Labor Hour
DMA	Depot Maintenance Activity
DMI	Depot Maintenance Interservicing
DMIF	Depot Maintenance Industrial Fund
DMISA	Depot Maintenance Inter-Service Agreement
DMPMS	Depot Maintenance Performance Measurement System
DMSC	Depot Maintenance Support Center
DMRD	Defense Management Report Decision
DOD	Department of Defense
DODD	Department of Defense Directive
DODI	Department of Defense Instruction
DPC	Depot Production Center
EDI	Electronic Data Interchange
EDMICS	Engineering Drawing Management Information Control System
FCIM	Flexible Computer Integrated Manufacturing
FMS	Foreign Military Sales
FY	Fiscal Year
FYDP	Future Year Defense Program
GCE	Ground Communications & Electronics
GTE	Gas Turbine Engine
IPE	Industrial Plant Equipment
IROAN	Inspect and Repair Only as Necessary
ISROMS	Integrated Structural Repair Overhaul and Maintenance System
IWG	Implementation Working Group

APPENDIX C
ABBREVIATIONS/ACRONYMS
(Cont'd)

JAX	Naval Aviation Depot Jacksonville
JDMAG	Joint Depot Maintenance Analysis Group
JIT	Just In Time
JLC	Joint Logistics Commanders
JLSC	Joint Logistics Systems Center
JPCG-DM	Joint Policy Coordinating Group on Depot Maintenance
JPMG	Joint Performance Measurement Group
JS	Joint Service
JSBP	Joint Service Business Plan
JSCWG	Joint Service Competition Working Group
KW	Kilowatt
LAN	Local Area Network
LBAD	Lexington-Bluegrass Army Depot
LBNSY	Long Beach Naval Shipyard
LCSS	Land Combat Support System
LEAD	Letterkenny Army Depot
LVS	Logistics Vehicle System
MCAPP	Modification, Corrosion, and Paint Program
MCLB	Marine Corps Logistics Base
MCLBA	Marine Corps Logistics Base Albany
MCLBB	Marine Corps Logistics Base Barstow
MCP	Military Construction Program
MIC	Maintenance Inventory Center
MICOM	Missile Command
MILCON	Military Construction
MINSY	Mare Island Naval Shipyard
MITLA	Microcircuit Technology in Logistics Applications
MLRS	Multiple Launch Rocket System
MMIS	Maintenance Management Information Systems
MRP II	Manufacturing Resources Planning
MSC	Major Subordinate Command
MZAD	Mainz Army Depot

APPENDIX C
ABBREVIATIONS/ACRONYMS
(Cont'd)

NADEP	Naval Aviation Depot
NAVAIR	Naval Air Systems Command
NAVCOMP	Navy Comptroller
NAVSEA	Naval Sea Systems Command
NAVSUP	Naval Supply Systems Command
NESECP	Naval Electronic Systems Engineering Center Portsmouth
NESECS	Naval Electronic Systems Engineering Center San Diego
NIMSC	Nonconsumable Item Materiel Support Code
NRIU	Nuclear Remote Interface Unit
NNSY	Norfolk Naval Shipyard
NORIS	Naval Aviation Depot North Island
NORVA	Naval Aviation Depot Norfolk
NSWCC	Naval Surface Warfare Center, Crane
NSWCIH	Naval Surface Warfare Center, Indian Head
NSWCL	Naval Surface Warfare Center, Louisville
NSY	Naval Shipyard
NUWCK	Naval Undersea Warfare Center, Keyport
NWS	Naval Weapons Station
NWSCH	Naval Weapons Support Center Charleston
NWSCO	Naval Weapons Station Concord
NWSEL	Naval Weapons Station Earle
NWSSB	Naval Weapons Station Seal Beach
NWSYK	Naval Weapons Station Yorktown
O&M	Operations and Maintenance
OCONUS	Outside the Continental United States
OC-ALC	Oklahoma City Air Logistics Center
OO-ALC	Ogden Air Logistics Center
OASD(P&L)	Office of the Assistant Secretary of Defense for Production and Logistics
OSD	Office of the Secretary of Defense

APPENDIX C
ABBREVIATIONS/ACRONYMS
(Cont'd)

PDM	Programmed Depot Maintenance
PHNSY	Pearl Harbor Naval Shipyard
PICA	Primary Inventory Control Activity
PIT	Process Improvement Team
PMA	Program Management - Air
PNCLA	Naval Aviation Depot Pensacola
PNSY	Philadelphia Naval Shipyard
POA&M	Plan of Action and Milestones
POM	Program Objective Memorandum
PSNSY	Puget Sound Naval Shipyard
PTNSY	Portsmouth Naval Shipyard
PUDA	Pueblo Depot Activity
RDT&E	Research, Development, Test and Evaluation
RFP	Request for Proposal
RIF	Reduction in Force
RRAD	Red River Army Depot
SAAD	Sacramento Army Depot
SA-ALC	San Antonio Air Logistics Center
SDLM	Standard Depot Level Maintenance
SEAD	Seneca Army Depot
SGE	Support Group Europe
SICA	Secondary Inventory Control Activity
SITS	Secretariat Implementation Tracking System
SM-ALC	Sacramento Air Logistics Center
SOW	Statement of Work
SPAWAR	Space and Naval Warfare Systems Command
SPC	Statistical Process Control
SPM	System Program Manager
SRA	Selected, Restricted Availability
SUPDESK	Supervisor's Desk

APPENDIX C
ABBREVIATIONS/ACRONYMS
(Cont'd)

TACOM	Tank-Automotive Command
TEAD	Tooele Army Depot
TMIWG	Tactical Missile Implementation Working Group
TOAD	Tobyhanna Army Depot
TOC	Theory of Constraints
TOW	Tube Launched Optically Tracked Wire Guided
TQL	Total Quality Leadership
TQM	Total Quality Management
TROSCOM	Troop Support Command
USAF	United States Air Force
USAFE	United States Air Force Europe
USD(A)	Under Secretary of Defense for Acquisition
USMC	United States Marine Corps
WR-ALC	Warner Robins Air Logistics Center

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS

SERVICE: ARMY — TOTAL

	CIV.	MIL.	TOTAL
FY91 DIRECT	10213	0	10213
FY91 INDIRECT	6030	58	6088
FY91 ARMY TOTAL	16243	58	16301
FY92 DIRECT	10207	0	10207
FY92 INDIRECT	5741	43	5784
FY92 ARMY TOTAL	15948	43	15991
FY93 DIRECT	9617	0	9617
FY93 INDIRECT	5353	43	5396
FY93 ARMY TOTAL	14970	43	15013
FY94 ARMY TOTAL (DIRECT & INDIRECT)	13020	41	13061
FY95 ARMY TOTAL (DIRECT & INDIRECT)	12019	41	12060
FY96 ARMY TOTAL (DIRECT & INDIRECT)	12491	41	12532
FY97 ARMY TOTAL (DIRECT & INDIRECT)	12491	41	12532

SERVICE: ARMY — **DEPOT:** ANAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1793	0	1793
FY91 INDIRECT	978	6	984
FY91 DEPOT TOTAL	2771	6	2777
FY92 DIRECT	1808	0	1808
FY92 INDIRECT	931	4	935
FY92 DEPOT TOTAL	2739	4	2743
FY93 DIRECT	1664	0	1664
FY93 INDIRECT	857	5	862
FY93 DEPOT TOTAL	2521	5	2526
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	2470	5	2475
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	1653	5	1658
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	1620	5	1625
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	1620	5	1625

SERVICE: ARMY — **DEPOT:** CCAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1969	0	1969
FY91 INDIRECT	1249	5	1254
FY91 DEPOT TOTAL	3218	5	3223
FY92 DIRECT	1945	0	1945
FY92 INDIRECT	1192	2	1194
FY92 DEPOT TOTAL	3137	2	3139
FY93 DIRECT	1906	0	1906
FY93 INDIRECT	1168	11	1179
FY93 DEPOT TOTAL	3074	11	3085
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	3013	11	3024
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2764	11	2775
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2709	11	2720
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2709	11	2720

SERVICE: ARMY — **DEPOT:** LEAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1135	0	1135
FY91 INDIRECT	742	13	755
FY91 DEPOT TOTAL	1877	13	1890
FY92 DIRECT	1127	0	1127
FY92 INDIRECT	691	13	704
FY92 DEPOT TOTAL	1818	13	1831
FY93 DIRECT	1158	0	1158
FY93 INDIRECT	711	14	725
FY93 DEPOT TOTAL	1869	14	1883
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	1869	14	1883
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2272	14	2286
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2940	14	2954
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2940	14	2954

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS
(CONT'D)

SERVICE: NAVSEA **DEPOT:** NNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	5219	0	5219
FY91 INDIRECT	5688	103	5791
FY91 DEPOT TOTAL	10907	103	11010
FY92 DIRECT	5999	0	5999
FY92 INDIRECT	3998	103	4101
FY92 DEPOT TOTAL	9997	103	10100
FY93 DIRECT	5311	0	5311
FY93 INDIRECT	3186	100	3286
FY93 DEPOT TOTAL	8497	100	8597
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	7638	99	7737
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	9094	96	9190
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	10146	93	10239
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	9641	93	9734

SERVICE: NAVSEA **DEPOT:** PHNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	2300	0	2300
FY91 INDIRECT	2738	52	2790
FY91 DEPOT TOTAL	5038	52	5090
FY92 DIRECT	2366	0	2366
FY92 INDIRECT	2175	52	2227
FY92 DEPOT TOTAL	4541	52	4593
FY93 DIRECT	2544	0	2544
FY93 INDIRECT	1958	51	2009
FY93 DEPOT TOTAL	4502	51	4553
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	4047	51	4098
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	3545	51	3596
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	3762	51	3813
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	4000	50	4050

SERVICE: NAVSEA **DEPOT:** PNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	3902	0	3902
FY91 INDIRECT	2996	84	3080
FY91 DEPOT TOTAL	6898	84	6982
FY92 DIRECT	3903	14	3917
FY92 INDIRECT	2296	28	2324
FY92 DEPOT TOTAL	6199	42	6241
FY93 DIRECT	3150	0	3150
FY93 INDIRECT	1932	7	1939
FY93 DEPOT TOTAL	5082	7	5089
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	4568	0	4568
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	1200	0	1200
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0

SERVICE: NAVSEA **DEPOT:** PTNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	3248	0	3248
FY91 INDIRECT	3730	105	3835
FY91 DEPOT TOTAL	6978	105	7083
FY92 DIRECT	3301	0	3301
FY92 INDIRECT	2726	105	2831
FY92 DEPOT TOTAL	6027	105	6132
FY93 DIRECT	3084	0	3084
FY93 INDIRECT	2364	98	2462
FY93 DEPOT TOTAL	5448	98	5546
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	4897	96	4993
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	4290	95	4385
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	4552	95	4647
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	5076	94	5170

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS

SERVICE: ARMY TOTAL

	CIV.	MIL.	TOTAL
FY91 DIRECT	10213	0	10213
FY91 INDIRECT	6030	58	6088
FY91 ARMY TOTAL	16243	58	16301
FY92 DIRECT	10207	0	10207
FY92 INDIRECT	5741	43	5784
FY92 ARMY TOTAL	15948	43	15991
FY93 DIRECT	9617	0	9617
FY93 INDIRECT	5353	43	5396
FY93 ARMY TOTAL	14970	43	15013
FY94 ARMY TOTAL (DIRECT & INDIRECT)	13020	41	13061
FY95 ARMY TOTAL (DIRECT & INDIRECT)	12019	41	12060
FY96 ARMY TOTAL (DIRECT & INDIRECT)	12491	41	12532
FY97 ARMY TOTAL (DIRECT & INDIRECT)	12491	41	12532

SERVICE: ARMY DEPOT: ANAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1793	0	1793
FY91 INDIRECT	978	6	984
FY91 DEPOT TOTAL	2771	6	2777
FY92 DIRECT	1808	0	1808
FY92 INDIRECT	931	4	935
FY92 DEPOT TOTAL	2739	4	2743
FY93 DIRECT	1664	0	1664
FY93 INDIRECT	857	5	862
FY93 DEPOT TOTAL	2521	5	2526
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	2470	5	2475
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	1653	5	1658
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	1620	5	1625
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	1620	5	1625

SERVICE: ARMY DEPOT: CCAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1969	0	1969
FY91 INDIRECT	1249	5	1254
FY91 DEPOT TOTAL	3218	5	3223
FY92 DIRECT	1945	0	1945
FY92 INDIRECT	1192	2	1194
FY92 DEPOT TOTAL	3137	2	3139
FY93 DIRECT	1906	0	1906
FY93 INDIRECT	1168	11	1179
FY93 DEPOT TOTAL	3074	11	3085
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	3013	11	3024
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2764	11	2775
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2709	11	2720
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2709	11	2720

SERVICE: ARMY DEPOT: LEAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1135	0	1135
FY91 INDIRECT	742	13	755
FY91 DEPOT TOTAL	1877	13	1890
FY92 DIRECT	1127	0	1127
FY92 INDIRECT	691	13	704
FY92 DEPOT TOTAL	1818	13	1831
FY93 DIRECT	1158	0	1158
FY93 INDIRECT	711	14	725
FY93 DEPOT TOTAL	1869	14	1883
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	1869	14	1883
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2272	14	2286
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2940	14	2954
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2940	14	2954

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS
(CONT'D)

SERVICE: ARMY **DEPOT:** RRAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1260	0	1260
FY91 INDIRECT	759	14	773
FY91 DEPOT TOTAL	2019	14	2033
FY92 DIRECT	1356	0	1356
FY92 INDIRECT	796	8	804
FY92 DEPOT TOTAL	2152	8	2160
FY93 DIRECT	1332	0	1332
FY93 INDIRECT	782	4	786
FY93 DEPOT TOTAL	2114	4	2118
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	2118	4	2122
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2076	4	2080
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2034	4	2038
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2034	4	2038

SERVICE: ARMY **DEPOT:** SAAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1082	0	1082
FY91 INDIRECT	857	5	862
FY91 DEPOT TOTAL	1939	5	1944
FY92 DIRECT	1046	0	1046
FY92 INDIRECT	789	4	793
FY92 DEPOT TOTAL	1835	4	1839
FY93 DIRECT	690	0	690
FY93 INDIRECT	520	2	522
FY93 DEPOT TOTAL	1210	2	1212
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0

SERVICE: ARMY **DEPOT:** TOAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1816	0	1416
FY91 INDIRECT	772	3	775
FY91 DEPOT TOTAL	2588	3	2591
FY92 DIRECT	1793	0	1793
FY92 INDIRECT	732	3	735
FY92 DEPOT TOTAL	2525	3	2528
FY93 DIRECT	1757	0	1757
FY93 INDIRECT	718	4	722
FY93 DEPOT TOTAL	2475	4	2479
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	2426	4	2430
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2377	4	2381
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2329	4	2333
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2329	4	2333

SERVICE: ARMY **DEPOT:** TEAD

	CIV.	MIL.	TOTAL
FY91 DIRECT	1158	0	1158
FY91 INDIRECT	673	12	685
FY91 DEPOT TOTAL	1831	12	1843
FY92 DIRECT	1132	0	1132
FY92 INDIRECT	610	9	619
FY92 DEPOT TOTAL	1742	9	1751
FY93 DIRECT	1110	0	1110
FY93 INDIRECT	597	3	600
FY93 DEPOT TOTAL	1707	3	1710
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	1124	3	1127
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	877	3	880
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	859	3	862
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	859	3	862

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS
(CONT'D)

SERVICE: NAVAIR			TOTAL
	CIV.	MIL.	TOTAL
FY91 DIRECT	11165	1	11166
FY91 INDIRECT	10717	278	10995
FY91 NAVAIR TOTAL	21882	279	22161
FY92 DIRECT	10360	0	10360
FY92 INDIRECT	8988	259	9247
FY92 NAVAIR TOTAL	19348	259	19607
FY93 DIRECT	10022	0	10022
FY93 INDIRECT	8591	255	8846
FY93 NAVAIR TOTAL	18613	255	18868
FY94 NAVAIR TOTAL (DIRECT & INDIRECT)	18822	245	19067
FY95 NAVAIR TOTAL (DIRECT & INDIRECT)	17166	247	17413
FY96 NAVAIR TOTAL (DIRECT & INDIRECT)	15999	247	16246
FY97 NAVAIR TOTAL (DIRECT & INDIRECT)	14950	253	15203

SERVICE: NAVAIR		DEPOT:	ALMD
	CIV.	MIL.	TOTAL
FY91 DIRECT	1929	0	1929
FY91 INDIRECT	1779	33	1812
FY91 DEPOT TOTAL	3708	33	3741
FY92 DIRECT	1718	0	1718
FY92 INDIRECT	1566	32	1598
FY92 DEPOT TOTAL	3284	32	3316
FY93 DIRECT	1557	0	1557
FY93 INDIRECT	1417	31	1448
FY93 DEPOT TOTAL	2974	31	3005
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	2979	31	3010
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2762	31	2793
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2580	31	2611
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2412	33	2445

SERVICE: NAVAIR		DEPOT:	CHYPT
	CIV.	MIL.	TOTAL
FY91 DIRECT	1628	1	1629
FY91 INDIRECT	1530	111	1641
FY91 DEPOT TOTAL	3158	112	3270
FY92 DIRECT	1440	0	1440
FY92 INDIRECT	1327	91	1418
FY92 DEPOT TOTAL	2767	91	2858
FY93 DIRECT	1426	0	1426
FY93 INDIRECT	1260	91	1351
FY93 DEPOT TOTAL	2686	91	2777
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	2748	90	2838
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2529	90	2619
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2360	90	2450
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2206	90	2296

SERVICE: NAVAIR		DEPOT:	JAX
	CIV.	MIL.	TOTAL
FY91 DIRECT	1518	0	1518
FY91 INDIRECT	1499	30	1529
FY91 DEPOT TOTAL	3017	30	3047
FY92 DIRECT	1507	0	1507
FY92 INDIRECT	1032	30	1062
FY92 DEPOT TOTAL	2539	30	2569
FY93 DIRECT	1497	0	1497
FY93 INDIRECT	998	30	1028
FY93 DEPOT TOTAL	2495	30	2525
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	2503	30	2533
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2308	30	2338
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2148	30	2178
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2006	30	2036

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS
(CONT'D)

SERVICE: NAVAIR **DEPOT:** NORIS

	CIV.	MIL.	TOTAL
FY91 DIRECT	2158	0	2158
FY91 INDIRECT	1995	29	2024
FY91 DEPOT TOTAL	4153	29	4182
FY92 DIRECT	1858	0	1858
FY92 INDIRECT	1507	32	1539
FY92 DEPOT TOTAL	3365	32	3397
FY93 DIRECT	1947	0	1947
FY93 INDIRECT	1572	32	1604
FY93 DEPOT TOTAL	3519	32	3551
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	3553	32	3585
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	3187	32	3219
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2957	32	2989
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2758	32	2790

SERVICE: NAVAIR **DEPOT:** NORVA

	CIV.	MIL.	TOTAL
FY91 DIRECT	2173	0	2173
FY91 INDIRECT	2136	38	2174
FY91 DEPOT TOTAL	4309	38	4347
FY92 DIRECT	2061	0	2061
FY92 INDIRECT	1924	34	1958
FY92 DEPOT TOTAL	3985	34	4019
FY93 DIRECT	1996	0	1996
FY93 INDIRECT	1881	33	1914
FY93 DEPOT TOTAL	3877	33	3910
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	3961	30	3991
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	3569	30	3599
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	3326	30	3356
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	3109	32	3141

SERVICE: NAVAIR **DEPOT:** PNCLA

	CIV.	MIL.	TOTAL
FY91 DIRECT	1759	0	1759
FY91 INDIRECT	1778	37	1815
FY91 DEPOT TOTAL	3537	37	3574
FY92 DIRECT	1776	0	1776
FY92 INDIRECT	1632	40	1672
FY92 DEPOT TOTAL	3408	40	3448
FY93 DIRECT	1599	0	1599
FY93 INDIRECT	1463	38	1501
FY93 DEPOT TOTAL	3062	38	3100
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	3078	32	3110
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	2811	34	2845
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	2628	34	2662
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	2459	36	2495

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS
(CONT'D)

SERVICE: NAVSEA (SHIPYARDS) **TOTAL**

	CIV.	MIL.	TOTAL
FY91 DIRECT	29489	0	29489
FY91 INDIRECT	30085	684	30769
FY91 SHIP TOTAL	59574	684	60258
FY92 DIRECT	32008	14	32022
FY92 INDIRECT	22418	613	23031
FY92 SHIP TOTAL	54426	627	55053
FY93 DIRECT	29763	0	29763
FY93 INDIRECT	20065	571	20636
FY93 SHIP TOTAL	49828	571	50399
FY94 SHIP TOTAL (DIRECT & INDIRECT)	44790	557	45347
FY95 SHIP TOTAL (DIRECT & INDIRECT)	39241	551	39792
FY96 SHIP TOTAL (DIRECT & INDIRECT)	41633	546	42179
FY97 SHIP TOTAL (DIRECT & INDIRECT)	46428	544	46972

SERVICE: NAVSEA **DEPOT:** CHNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	3549	0	3549
FY91 INDIRECT	3700	61	3761
FY91 DEPOT TOTAL	7249	61	7310
FY92 DIRECT	3455	0	3455
FY92 INDIRECT	2311	59	2370
FY92 DEPOT TOTAL	5766	59	5825
FY93 DIRECT	3448	0	3448
FY93 INDIRECT	2170	57	2227
FY93 DEPOT TOTAL	5618	57	5675
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	5050	57	5107
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	4424	57	4481
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	4694	57	4751
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	5235	57	5292

SERVICE: NAVSEA **DEPOT:** LBNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	2141	0	2141
FY91 INDIRECT	2213	37	2250
FY91 DEPOT TOTAL	4354	37	4391
FY92 DIRECT	2379	0	2379
FY92 INDIRECT	1913	26	1939
FY92 DEPOT TOTAL	4292	26	4318
FY93 DIRECT	2184	0	2184
FY93 INDIRECT	1843	22	1865
FY93 DEPOT TOTAL	4027	22	4049
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	3620	21	3641
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	3171	21	3192
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	3365	21	3386
FY97 DEPOT TOTAL DIRECT & INDIRECT)	3000	21	3021

SERVICE: NAVSEA **DEPOT:** MINSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	2984	0	2984
FY91 INDIRECT	3266	108	3374
FY91 DEPOT TOTAL	6250	108	6358
FY92 DIRECT	3742	0	3742
FY92 INDIRECT	2291	106	2397
FY92 DEPOT TOTAL	6033	106	6139
FY93 DIRECT	3557	0	3557
FY93 INDIRECT	2224	106	2330
FY93 DEPOT TOTAL	5781	106	5887
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	5196	103	5299
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	4553	101	4654
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	6030	101	6131
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	6807	101	6908

APPENDIX D
DEPOT MAINTENANCE PERSONNEL LEVELS
(CONT'D)

SERVICE: NAVSEA **DEPOT:** NNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	5219	0	5219
FY91 INDIRECT	5688	103	5791
FY91 DEPOT TOTAL	10907	103	11010
FY92 DIRECT	5999	0	5999
FY92 INDIRECT	3998	103	4101
FY92 DEPOT TOTAL	9997	103	10100
FY93 DIRECT	5311	0	5311
FY93 INDIRECT	3186	100	3286
FY93 DEPOT TOTAL	8497	100	8597
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	7638	99	7737
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	9094	96	9190
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	10146	93	10239
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	9641	93	9734

SERVICE: NAVSEA **DEPOT:** PHNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	2300	0	2300
FY91 INDIRECT	2738	52	2790
FY91 DEPOT TOTAL	5038	52	5090
FY92 DIRECT	2366	0	2366
FY92 INDIRECT	2175	52	2227
FY92 DEPOT TOTAL	4541	52	4593
FY93 DIRECT	2544	0	2544
FY93 INDIRECT	1958	51	2009
FY93 DEPOT TOTAL	4502	51	4553
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	4047	51	4098
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	3545	51	3596
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	3762	51	3813
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	4000	50	4050

SERVICE: NAVSEA **DEPOT:** PNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	3902	0	3902
FY91 INDIRECT	2996	84	3080
FY91 DEPOT TOTAL	6898	84	6982
FY92 DIRECT	3903	14	3917
FY92 INDIRECT	2296	28	2324
FY92 DEPOT TOTAL	6199	42	6241
FY93 DIRECT	3150	0	3150
FY93 INDIRECT	1932	7	1939
FY93 DEPOT TOTAL	5082	7	5089
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	4568	0	4568
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	1200	0	1200
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	0	0	0

SERVICE: NAVSEA **DEPOT:** PTNSY

	CIV.	MIL.	TOTAL
FY91 DIRECT	3248	0	3248
FY91 INDIRECT	3730	105	3835
FY91 DEPOT TOTAL	6978	105	7083
FY92 DIRECT	3301	0	3301
FY92 INDIRECT	2726	105	2831
FY92 DEPOT TOTAL	6027	105	6132
FY93 DIRECT	3084	0	3084
FY93 INDIRECT	2364	98	2462
FY93 DEPOT TOTAL	5448	98	5546
FY94 DEPOT TOTAL (DIRECT & INDIRECT)	4897	96	4993
FY95 DEPOT TOTAL (DIRECT & INDIRECT)	4290	95	4385
FY96 DEPOT TOTAL (DIRECT & INDIRECT)	4552	95	4647
FY97 DEPOT TOTAL (DIRECT & INDIRECT)	5076	94	5170